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E. F. M. Thurn
The history of the
Rosanna expedition
of 1884
1887

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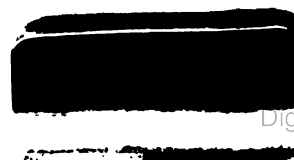


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TRANSACTIONS
OF
THE LINNEAN SOCIETY OF LONDON.

THE BOTANY OF THE RORAIMA EXPEDITION OF 1884.

By E. F. IM THURN.

(Communicated by Sir J. D. Hooker, K.C.S.I.)



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XV. *The Botany of the Roraima Expedition of 1884: being Notes on the Plants observed, by EVERARD F. IM THURN; with a list of the Species collected, and Determinations of those that are new, by Prof. OLIVER, F.R.S., F.L.S., and others. (Communicated by Sir J. D. HOOKER, K.C.S.I., F.R.S., F.L.S., &c.)*

(Plates XXXVII.-LVI.)

[Read 15th April, 1886.]

I. *Notes on the Plants observed during the Roraima Expedition of 1884.*

By EVERARD F. IM THURN.

AS was expected, the plants collected on the way to Roraima, and especially about that mountain itself, during the recent expedition and first ascent to its summit, have proved of great interest, now that they have been examined and catalogued at Kew. Several specialists have most kindly lent their aid in examining and determining these plants. While Professor Oliver undertook the bulk of the collection, Mr. J. G. Baker, besides determining a few of the Petaloid Monocotyledons, has, with Mr. G. S. Jenman of British Guiana, worked out the Ferns, Mr. H. N. Ridley, of the British Museum, the Orchids and Cyperaceæ, and Mons. E. Marchal the Araliaceæ, Dr. Engler has described a new *Moronobea*, Mr. E. Brown a new Aroid, and Mr. Mitten has named the Muscales; lastly, Dr. Maxwell Masters has supplied a note on two Passifloræ, perhaps new, but imperfectly represented. In all, fifty-three new species and three new genera have been described by these various workers.

The number of species collected would probably have been greater but for the extreme difficulty of drying plants in so excessively damp a climate as that of Roraima, and also for the fact that the other very serious labours inseparable from the direction of such an expedition greatly curtailed the time I was able to devote to the preparation of botanical specimens. As regards the number of new generic and specific forms collected, great as it is, it would undoubtedly have been much greater but for the fact (unfortunate in this respect) that my collection was made at exactly the same period of the year [November and December] at which such collecting as had been done before about Roraima had been accomplished by Sir Robert and Dr. Schomburgk and by Karl Appun*.

* The list of visitors to Roraima, other than natives, is as follows:—Sir ROBERT SCHOMBURGK, then at the head of a boundary commission, was there in 1838, and again, with his brother, Dr. RICHARD SCHOMBURGK, the present director of the Adelaide Botanical Gardens, in 1842. Both made considerable botanical collections, which were distributed, I believe, mainly between the Herbaria at Kew, the British Museum, and at Berlin. KARL APPUN was at Roraima in 1864; his collections are chiefly at Kew. C. B. BROWN, then the geological surveyor of British Guiana, was there in 1869; two Englishmen, FLINT and EDDINGTON, were there in 1877; and two others, M'TURK and

Probably no district of equally small size, after such brief and cursory exploration, has yielded greater, or as great, botanical results as has Roraima; still more probable is it that few small districts are so distinctly marked off from the country immediately surrounding them by such great and remarkable peculiarities in their vegetation. In brief, the district of Roraima is, from a botanical point of view, chiefly interesting as an oasis clothed with a vegetation distinct from that of the country which immediately surrounds it, and at the same time, also in a very marked degree, peculiar either to this special district or to this in common with a few other almost equally isolated, but widely separated districts.

I cannot devote these prefatory remarks (in which I have the privilege of introducing the list and description of my collection, so kindly prepared by the authorities above mentioned) to a better purpose than to make as emphatic a statement as I can *of the isolated character, botanically, of the Roraima district, of the probable botanical relation to certain other possibly similar districts, and of the general appearance of the very peculiar and distinct vegetation of these districts* *.

The whole area known under the name of Guiana may be likened to a wedge driven into the north-eastern shoulder of South America. Geographically, it is thus placed between Brazil on the south and Venezuela on the north; for our present purpose it will, however, be better to describe its position somewhat differently. The artificially formed political divisions of the continent for obvious reasons correspond very closely with the tracts naturally differentiated each by its own river-system. As it is along the river-systems that the migration of animals and plants chiefly occur, the customary and convenient names of these divisions therefore really correspond somewhat closely with the natural and important differences in flora and in fauna, which distinguish the narrow river-basins. Thus, as Venezuela is essentially the tract drained by the great river Orinoco, and as the northern part of Brazil is essentially the tract drained by the great river Amazon, and as Guiana, intermediate between these two, consists essentially of the parallel tracts drained by comparatively smaller rivers (of which the Essequibo, the Demerara, the Berbice, the Corentyn, the Saramacca, and the Maroni may be

BODDAM WETHAM, in 1878. None of these made botanical collections. DAVID BURKE, an English orchid-collector, was there in 1881, and brought home interesting living plants, among others, the South-American pitcher-plant (*Heliamphora nutans*), which has, I believe, since been distributed by Messrs. Veitch & Sons. HENRY WHITELEY, an English collector of bird-skins, was there on several occasions between 1879 and 1884, and is, I believe, again there to the present moment, but he has collected no plants. SIEDEL, a German orchid-collector, was there in April 1884, and again, with us, in December of the same year. He brought back only living plants, especially the magnificent *Cattleya Lawrenceana*, which have since been distributed by Mr. H. Sander. Of these Siedel, the only traveller with an eye for plants who has been at Roraima except in the last months of the year, assures me that the abundance of flower was much greater there in April than in December. But in the latter month the natives' Cassava-fields are in full bearing, and provision is therefore much more easily attainable.

* I use the phrase "Roraima district" as including not only the mountain of that name, but the whole of the small group of similar sandstone mountains of which Roraima is the best known, and at present the only explored member.

mentioned), so Venezuela, Guiana, and North Brazil therefore represent tracts which are really more or less differentiated from one another in their flora and fauna.

Now, as the whole of the tract under consideration (that drained by the Orinoco, the Amazon, and the intermediate rivers) rises gradually, or, more generally, by step-like ascents, from the sea-level on its east toward the tableland on its west (*i. e.* the centre of the continent), it is, of course, on this tableland that the rivers take their origin. And as, owing to the irregularity of the surface of this tableland, and still more that of its slope toward the eastern sea, it follows that each of these rivers collects its head-waters from unusually widely separated localities, so it often happens that two or more of these rivers draw some portion of their head-waters from unusually contiguous localities. Thus it is conceivable, and even probable, that any peculiar animal or vegetable forms, which may originate at one of these localities which supplies water to very divergent river-systems may distribute themselves over very wide areas by passing along the courses of the various rivers thence arising.

It happens that the rock-pillars of the Roraima group, rising some 5000 feet over the general level of the tableland, itself at that part some 3000 feet above the level of the sea, pour down from their summits streams which go to swell the Orinoco, the Essequibo, and the Amazon—in other words, the three rivers respectively of Venezuela, Guiana, and Brazil. Now, as has been already mentioned, the flora of Roraima is of a very remarkably peculiar character. A most interesting question still awaits solution, namely, the relation of the flora of Roraima to the floras of Venezuela, Guiana, and Brazil.

No answer, I say, has yet been attempted to this question; nor can I pretend to suggest any. I am, however, able here to offer, as data to be considered in the question, some very general account of the flora of Guiana, and a rather more special account of the flora of Roraima in its relation to that of Guiana.

Guiana, as has been said, rises gradually from the east toward the high tableland of the interior of the continent. Instead, however, of thus placing ourselves in imagination on its sea-coast and looking westward up its gradual slope, let us imagine ourselves on the tableland on Roraima, and that we are looking eastward down toward the sea. Were such a bird's-eye view really possible, we should find that the tableland, or savannah, as it is there called, is an open treeless country, its elevated surface hardly anywhere level, but swelling up in many hills, and even into some mountain-ranges. We find that only along the courses of the rivers, or in the other lower parts where water has accumulated in some form, are there more or less extensive belts of trees, and that, on the savannah itself, even these trees are, considering that we are in the tropics, of no great size. Further eastward, on the lower part of the slope toward the sea, where the rivers have already grown wider and approached each other more nearly, the trees are more numerous and larger. Still further eastward, lower down the slope, the belts of trees, each pertaining to its own river, have widened with the rivers, till they have approached and then joined each other; here the trees are of yet larger size. At last, at the bottom of the slope, between its foot and the still far distant sea-waves, the wide

tract of alluvial soil which has been deposited, having either been brought down by the rivers or cast up from the sea, is virtually entirely occupied by the omnipresent forest of trees, which have there attained their true gigantic tropical size. If we except certain small patches of very swampy open land within this forest of the alluvial tract, locally called "wet savannahs," all is forest except the very narrow strip of land actually washed by the waves, and not even that toward the north.

Very different and distinct floras characterize the parts of Guiana thus variously conditioned, though, naturally, a certain number of species are common to all three.

Where the narrow sea-washed strip has been artificially disafforested, a generally dwarf and weed-like flora prevails, very rarely consisting of non-indigenous plants.

Within the forest, after the generally great height of the trees and often the abundance of palms, perhaps the most noteworthy features of the vegetation, are in the first place, the great scarcity of mosses, herbage, and low-growing plants, especially of any with conspicuous flowers, and the consequent barrenness of the soil, which is relieved by only a few scattered ferns, ginger-worts, *Caladiums* and other aroids, *Dieffenbachias*, *Cyperaceæ*, and other shade-loving plants; and, in the next place (though this is hardly discernible from below), the abundance of the flowering creepers and epiphytes spread over the matted tops of the dense and lofty trees. The representatives of the low-growing flowering plants of the thinner, lighter woods of temperate climates have here, in this dense shade of the tropical forest, to send their immensely long, flowerless, creeping stems up some one or even two hundred feet, to reach above the highest tree-branches, before they can break into bloom. Only as semiaquatics along the river-side there are a few showy-flowered dwarf plants.

Quite different again is it on the savannahs, where, among the grasses which naturally form the chief vegetation, are scattered a considerable number of bright-flowered dwarf plants; though even here the abundance of bloom very rarely reaches the extraordinary development which it often does in the meadows of temperate climates. Rather striking, too, is it that on these savannahs many of the bright-flowered plants, unlike those of temperate meadows, are here also true climbing-plants, leguminous chiefly, and various species of *Echites*, though their stems, instead of climbing far and high over giant trees, here only ramble weakly over the short grasses.

In each of these distinct floras of the coast, the forest, and of the savannah, the number of species is of course great; but in each separate district the species characteristic of it are, as a rule, remarkably widely and evenly scattered throughout its extent. For example, within the forest-district probably by far the larger number of species have an unbroken distribution throughout its extent, and of the remaining species most have an unbroken distribution throughout the district from north to south; though they may be limited from east to west, according, that is, to the greater or less distance from the sea or to the higher or lower position on the general upward slope of the country. On the savannah, the level of which probably corresponds more or less closely with the general level of the main tableland of that part of the continent, the distribution of the main species is still more even and universal. On almost every part of the savannah

certain grasses, dwarf shrubs, and herb-like plants, form the dominant vegetation. Yet a few remaining parts are marked by the occurrence of certain distinct and, so to speak, localized species, which are scattered more or less widely among the more ordinary forms. Again, a very few other parts are still more distinctly marked, and made very distinct areas, by the more or less complete absence of the ordinary forms, and the substitution there of an entirely new and generally very distinct set of species. These areas with a few localized species, several of which were passed by us on our way to Roraima, and still more these areas of distinct vegetation, of which the Kaieteur savannah which we traversed, and especially Roraima itself, are remarkably fine examples of the utmost botanical interest.

A few notes must first be given of the species here described as localized. It is to be remembered that these notes were made during a single walk, long as it was, through a country otherwise almost absolutely unknown; so that though these species were noticed by me because I saw them either only in one spot, or at least in very few spots—*i. e.* I passed through either only one distinct group or through very few such groups of them—yet it is, of course, impossible to assert that many other such distinct groups do not occur wherever the requisite soil and other circumstances permit.

A considerable number of such localized species occur on tracts where the soil is of so peculiar a nature as to have earned a special name for such places from the natives, who call them *Eppellings*. This name is applied by the Arekoonas to certain tracts in which the underlying very soft sandstone is overlaid by a coating of hard dense and dry mud, or, in some other cases, of hard conglomerate. Wherever, as is often the case, this hard-mud surface is unbroken, it resembles an asphalt pavement, or, perhaps, rather a floor made of hard-beaten earth. But this curious earth-surface overlies hill and dale alike—is, therefore, not often level. Wherever, then, there has been the slightest crack in its surface, rain-water gathers, and, having once obtained a lodgment, eats away and enlarges the crack. The result is an eppelling surface, which, instead of being like an asphalt pavement, is like a pavement formed of irregularly-shaped and scattered flagstones. But, again, the mud-layer which overlies the eppelling being by no means thick, whenever this has once been indented, as just described, by many cracks enlarged by water, these cracks are soon engraved through the mud-layer down to the soft sandstone below; and, when this has once occurred, the sandstone thus exposed, which yields to the action of the water even more readily than does the hard mud, is rapidly worked out. In this way the eppelling is made to assume the form of a number of blocks of sandstone, often pillar-like. Each of such blocks is capped and protected by a patch of the original hard earth, or, in other cases, of the original conglomerate. (See woodcut, fig. 1, p. 254.)

Now, where the original eppelling surface is unbroken, in which state we have compared it to an asphalt pavement, it is as entirely devoid of vegetation as such an artificial pavement would be. But where the surface of the eppelling has reached its furrowed stage, a few plants find lodgment, chiefly certain orchids and other such plants, of which the roots are of such a nature that, in the dry season, when the furrows are waterless, the whole plant shrinks into complete rest, and even in some cases loses its root-hold, and is

blown about on the surface of the eppelling until the next rains come, when it again throws out anchor-like roots into some new furrow.

Fig. 1.



Rock-pillars on the summit of Roraima.

has already been said that, even on the otherwise open savannahs, more or less extensive belts of forest often clothe the sides of the narrower parts of the valleys through which the rivers run. One such place we came to, where, after crossing the Ireng river and the low watershed which there separates that river from its tributary, the Karakanang, we were descending toward the level of the last-named river. It was here that, in a somewhat extensive wood of which most of the trees were common species of *Cassia*, we found the dense, shrubby underwood to consist almost entirely of this beautiful scarlet-flowered *Aphelandra*.

Throughout a small tract on either side of the Ireng river, where the ground was almost

tendency is a *Catasetum* (*C. cristatum*? [No. 148]); another is the new and very beautiful *Oncidium*, named and described by Mr. Ridley in the appended list as *O. orthostates* [No. 12]. Sometimes, too, in this same state of the eppelling, especially where such ground occurs on the brows of exposed hills, shrubs of considerable size find anchorage in the furrows and flourish. One such hill-top which we passed was made very beautiful in this way by a large and isolated patch of the large rosy-flowered *Bonnetia sessilis*, Benth. [No. 11]. In another similar place we passed through a distinct patch of the compact *Stiffia condensata*, Baker [No. 110]. And more than one such place was distinguished by thickets of *Gomphia guianensis* [No. 15].

Lastly, as regards the eppellings where the furrows of these places have been worked down into the sandstone, and have been much enlarged, the deep ravines and pits of all sizes thus formed, though bare of vegetation wherever the process of water-washing still continues in violent action, where this action has ceased owing to the stoppage of the outlet, or has become much moderated, are comparatively thickly clothed with vegetation.

Another remarkable localized plant, though not occurring on an eppelling, was the beautiful *Aphelandra pulcherrima*? [No. 14]. It

entirely covered by a gravelly layer of shattered conglomerate, a very beautiful herb, with flowers of an intense violet-blue—a very rare colour in Guiana—was common, and pleasantly reminded me of an English “viper’s bugloss.” It was *Stachytarpheta mutabilis*, Vahl [No. 1], which seems to me to correspond to my description of a localized species.

Again, between the Ireng and the Cotinga rivers, there grew in abundance, and evidently as a native, a plant [*Furcraea gigantea*] which, common enough near the coast of Guiana in cultivation, and even as an evident escape from cultivation, is nowhere else, as far as I have seen in many wanderings, wild in that colony.

Lastly, as regards localized species, I would mention several dwarf bamboos, none of which, unfortunately, did I succeed in finding in flower. One of these, a wonderfully graceful species, appears to me peculiar, in that it grows in dense thickets on the open savannah. This was on the Ireng river, and more sparingly onward from there toward the Cotinga. Another of these bamboos (*Chusquea* [sp. ?], No. 18), I think the most graceful plant I ever saw, occurred sparingly, and only in one spot, on the Arapoo river close to the village of Tooroiking. A third bamboo, a climbing form (*Guadua*) [No. 359], occurred to me first on the same river, but is much more common on Roraima itself, and should perhaps be spoken of in connection with the vegetation of that mountain.

Turning next to the areas of distinct vegetation, the first to be mentioned is that of the Kaieteur savannah*. This is certainly a very remarkable place, with an equally remarkable vegetation. It is an open space, some two miles long by one across, in the heart of the ordinary dense forest, and some four days’ journey on foot from the nearest open country. It has been said that the descent from the tableland of the interior toward the sea is not a gradual slope, but occurs chiefly in a series of step-like descents. These descents are generally of no great individual height; but that of the Kaieteur takes the form of an almost abrupt cliff—at the Kaieteur fall itself it is an actual cliff—of between seven and eight hundred feet in height. The Potaro river, rising apparently from the neighbourhood of, but not actually on, Roraima, after an unknown upper course of considerable length, runs along one side of the almost perfectly level Kaieteur savannah, and precipitates itself, at the east end of that savannah, down the sheer descent of 800 feet. The savannah itself is virtually a flat exposed rock, many parts of which are as absolutely bare as a London pavement. This rock is sandstone, which, as in the eppellings (indeed it probably is one, but of unusually unbroken surface) is capped by a harder material, a layer of conglomerate. Just as the hard surface of the eppellings cracks, and eventually affords roothold in the fissures thus made for plants, so the hard conglomerate covering of the Kaieteur savannah has cracked, and in many of the fissures thus produced has given harbourage for plants. Some of these latter fissures have gradually been filled up by the accumulation of vegetable matter; others remain still open. On this savannah, however, the fissures are larger than is commonly the case in the eppellings—are, in fact, often very long but generally narrow fissures. Many of these are now entirely occupied by shrubs and dwarf trees. The lines of these masses of vegetation, necessarily following the direction of the fissures,

* Some excellent “Remarks on the aspect and flora of the Kaieteur Savannah” were published by my friend Mr. G. S. Jenman in ‘*ТМБЕРИ*’ vol. i. (1882) p. 229.

present, in most remarkable degree, the appearance of the well-marked designs laid out by a landscape-gardener; the whole effect is like that of an artificial garden, with regular groups of shrubs separated by wide paths and roads of clean bare rock. Moreover, it is not only in the fissures that plants grow on this savannah. As on the eppellings, so here too, a certain number of plants find sufficient foothold in the vegetable accumulations in the slight depressions in the conglomerate sheet before these have been engraved deeply enough to leave the sandstone exposed and to make regular fissures.

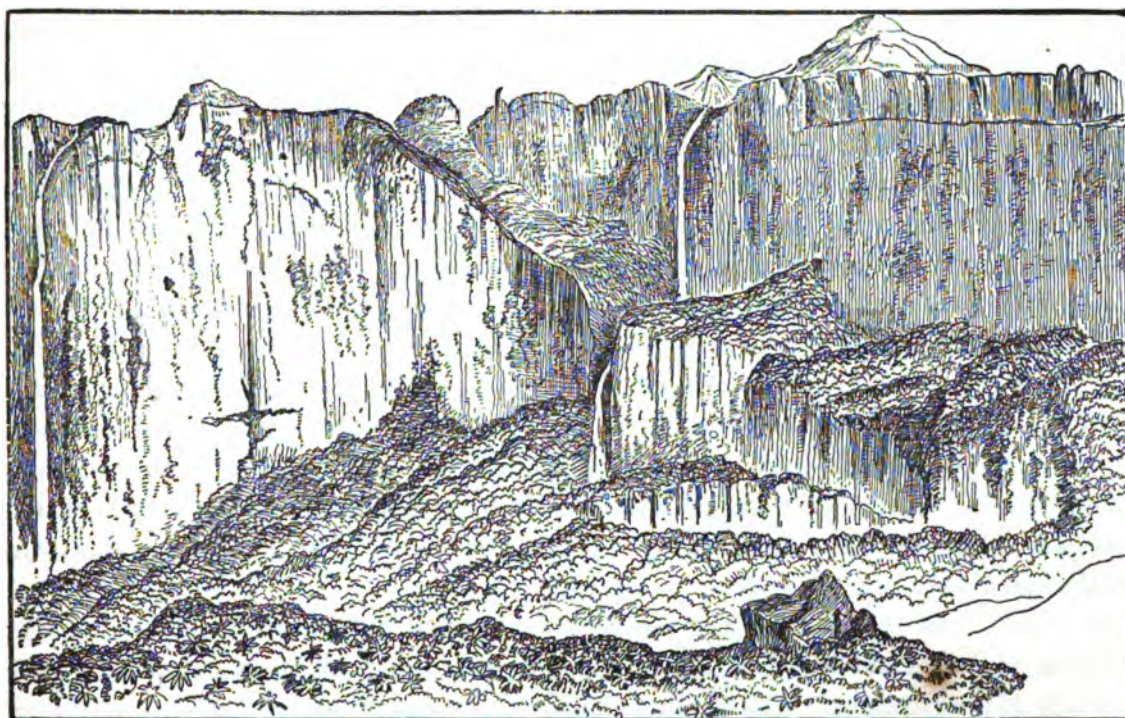
But not only is the arrangement of the vegetation of the savannah thus very remarkable; the plants composing this vegetation are also individually of great interest. As might be expected, very few of them occur in the forest which everywhere, and for a great distance, surrounds this strange open space. Much more remarkable is it that very few of these plants occur on the nearest savannah, nor, indeed, on the general savannah-land of the interior. And, most noteworthy of all is it, a very large number of these peculiar plants of this isolated savannah occur, often with slight but interesting differences, on Roraima.

By far the most striking, as it is also the most abundant, plant on the Kaieteur savannah is a huge aloe-like Bromeliaceous plant, *Brocchinia cordylinoides*, Baker, which was gathered there by Mr. Jenman and myself some years ago, but which was, until the Roraima expedition, unknown elsewhere. This gigantic plant, so striking as to compel notice even from the most unobservant traveller, is ranged in enormous numbers on the Kaieteur savannah, and indeed makes, to a large extent, the strangeness of that strange scene. There the height of a full-grown specimen, under favourable circumstances, is about 14 feet, and, in the older specimens at least, the crown of leaves is supported on a tall bare stem. It seems also there to flower abundantly. We shall see that the plant occurs, but with slightly different characters, on Roraima. Moreover, at the Kaieteur, in the axils of the leaves of this *Brocchinia*, and only in that position, grows a very remarkable and beautiful *Utricularia* (*U. Humboldtii*, Schombk.), with flower-stems 3 or 4 feet long, supporting its many splendidly large violet flowers. This plant too we found on Roraima, and with slightly different characters from those which it exhibits at the Kaieteur. Another remarkable and distinct plant on the Kaieteur savannah is a low-growing *Brocchinia* (*B. reducta*, Baker), also previously known only from there, and may be roughly described as resembling three or four sheets of yellowish-grey foolscap paper rolled loosely one round the other, the whole standing on one end of the roll. This plant I did not observe on Roraima, though I feel convinced that it will one day be found there; but I did see it, in very considerable quantity, in one small district about halfway between the Kaieteur and Roraima. Only one other plant common, but with a difference of form, to the two districts can be mentioned here. Mr. Jenman found at the Kaieteur a very striking new *Moronobea* (*M. Jenmani*, Engl.); and I found on Roraima another very remarkable congener (*M. intermedia*, Engl., No. 337), of which its describer says that it is intermediate between *M. riparia* and *M. Jenmani*.

In short, the Kaieteur savannah and Roraima may be regarded as two isolated areas marked by a very peculiar vegetation, which vegetation is, however, to a noteworthy extent, common to the two.

Before referring to the district of Roraima, I may mention that, if I may judge from the reports of the natives, and of the one or two white men who have been there, savannahs occur curiously like this very remarkable example at the Kaieteur (1) above Amailah fall on the Curiebrong river, a tributary of the Potaro, (2) above Orinidouie fall on the Ireng river, and (3) above a certain very large fall which exists (I have myself heard the roar of its waters) on the Potaro, about two days' boat journey above the Kaieteur. In each of these places the large and not easily mistakable *Brocchinia cordylinoides* is credibly said to occur; and it seems highly probable that with this some of the other, but less conspicuous, plants of the Kaieteur occur also on these other savannahs. In short, it may very probably be that each of these reported fall-savannahs is a distinct area, parallel and similar in vegetation to the Kaieteur savannah and to Roraima. In passing it may also here be noted that apparently a *Brocchinia*, similar to *B. cordylinoides*, occurs on the Organ Mountains, near Rio, in Brazil, reached by Gardner in 1837, and that in the axils of its leaves occurs a *Utricularia* (*U. nelumbifolia*, Gard.) which, to judge from Gardner's passing descriptions, must be strikingly similar to *U. Humboldtii* as it occurs on the Kaieteur savannah. Possibly

Fig. 2.



View of the south-east face of Roraima, showing the waterfall and ledge of ascent.

the Organ Mountains, too, resemble in some of their vegetable features the Kaieteur savannah and Roraima*.

* Gardner's description of the vegetation of the Organ Mountains (see his 'Travels in Brazil,' London, 1849, pp. 50-52, 402-403) reads extraordinarily like an account of the vegetation of Roraima. The height of the two elevations is about the same, but the Organ Mountains consist almost exclusively of granite, not, as Roraima does, of sandstone.

Let us now pass to the consideration of Roraima itself as an area of distinct vegetation ; and in so doing a few words must first be said as to the physical features of the mountains.

Roraima is one (certainly the best known, perhaps really the most remarkable) of a group of pillar-like sandstone mountains capped with hard conglomerate, which group is, it seems to me, identical in nature and origin with the groups of sandstone pillars, capped with conglomerate or hardened mud, of the eppellings already described. In short, Roraima and its fellow mountains seem to be an eppelling on a gigantic scale. Some notion of how large this scale is may be gathered from the fact that Roraima itself, one pillar of the group, is almost exactly four miles wide along its south-eastern face, and is apparently seven or eight miles long from south to north, and that its height is some 5000 feet above the general level of the plain from which it rises.

This 5000 feet of height, it must be explained, is made up of a sloping base, the pediment of the pillar, of about 3000 feet, which is surmounted by the more strict pillar-like portion, 2000 feet in height. The plateau on top of the pillar is a very slightly, almost imperceptibly, hollowed basin, four miles wide by some seven or eight long, over which are scattered innumerable single rocks and piles of rocks, the largest of which are apparently some eighty or ninety feet in height. The sloping basal part of the mountain is, everywhere but toward the south-east, covered by dense, but not lofty forest ; while on the south-east a considerable portion of it (which portion does not, however, extend up to the foot of the actual cliff) is treeless and grass-covered. The cliff itself is bare, but for a comparatively few mosses, ferns, grasses, and trailing plants clinging closely to the rougher parts of its surface, especially where the many waterfalls trickle down the rock-face, and for the dwarf shrubs, ever dwarfer and more alpine in character toward the top, which have found a lodgment on the few transverse ledges which break the evenness of the surface. The hollow basin at the top of the pillar is, wherever a little soil has accumulated in the depressions of the bare rock which constitutes the greater part of its surface, clothed with a dwarf herb-like vegetation of most remarkable appearance, consisting largely of various species of *Pæpalanthus*, a *Drosera*, a few terrestrial orchids (these not very conspicuous in flower), a remarkable low-growing aloe-like *Abolboda* of which I shall have more to say hereafter, various ground-clinging shrubs of alpine *Vaccinium*-like character, and of a very few single shrubs, all of one species (*Bonnetia Roraimæ*, Oliv., n. sp. [No. 330]), of larger growth, even though this is but some three feet high.

Nor in this brief sketch of the physical features of Roraima in their bearing on the vegetation is it possible to avoid mention of the great moisture of the atmosphere which surrounds the mountain. The shallow basin of the upper plateau always holds much water, and probably at times is almost full ; the sides of the cliff are ever moistened by the innumerable rills and streams poured down from the plateau above on to the sloping base ; and this basal portion itself is, on the more level undulating parts of its exposed surface, a mere spongy swamp, while in its forested parts it is traversed by almost innumerable rills hastening down to join the large rivers of the plain below.

When dealing with the vegetation along our line of march to Roraima I pointed out that I could only pretend to speak of the plants actually along that line ; in now

dealing with the vegetation of Roraima itself I can only speak of that of the south-eastern side of this mountain, which alone I was able to examine closely. We spent nearly a month on this side, where it is treeless, savannah-like, and swampy, and we climbed to the top of the mountain by a ledge running obliquely up the south-eastern face of its cliff (see fig. 2, p. 257).

It was not till we reached the top that we saw the most remarkable features in the wonderful plant-life of this very distinct area of vegetation. Even while only approaching the base of the mountain (which for convenience of description I will take to be marked on the south-eastern side by the bed of the Kookenaam river), and while we were still far off, we met for the first time with plants which we afterwards found commonly on Roraima, the outposts, as it were, of the remarkable group of plant-forms centred on Roraima. From the moment when the first of these distinctive plants of the mountain was met with till the moment, some weeks later, when we reached the top, we ever travelled onward into a more and more peculiar flora.

Our discovery, on the savannahs a full day's journey from Roraima, of the first outpost of the vegetation of that mountain was a very distinct event. We found a well-marked dense patch, perhaps some 40 yards in diameter, of *Abolboda Sceptrum*, Oliver, nov. sp. [No. 312], a compact and dwarf, yucca-like plant, with a rosette, perhaps a foot and a half in diameter, of most acutely needle-pointed leaves. This plant appeared again in patches once or twice before we reached Roraima, and formed much of the turf, as it were, both of the savannah slope of the base of that mountain and also of the top. It was, whenever it appeared, a constant source of annoyance and of danger, not only to the naked feet of my Indian companions, but also to my own canvas-clad feet. Luckily a rumour which in some way spread among us that these rosettes of vegetable bayonets were poisonous, after causing some rather comic alarm, proved groundless. Where we first found the plant, as also on the sloping base of the mountain, it was out of flower and, though its withered flower-stems were extant, was already seedless; but on the top we found it in full and striking flower. From the centre of the rosette of leaves rises a single stem, perhaps 18 inches in height, crowned by a very regularly formed whorl of dependent yellow flowers. The general appearance—the facies, to use a term recognized, I believe, by botanists—was remarkably like that of the yellow form of the Crown Imperial (*Fritillaria imperialis*). For the botanical description of this interesting plant, as indeed of all the other new plants of which I shall attempt to describe the facies, I must refer to the list carefully worked out at Kew*.

After passing the first station of *Abolboda Sceptrum* till we reached the actual foot of Roraima, at the bed of the Kookenaam river, we continued through a country over which, though it was still furnished chiefly with the ordinary savannah vegetation, were scattered a few, indeed as we advanced an ever-increasing number of new plants. Across this tract, about halfway between the station of *Abolboda* and the Kookenaam, runs the Arapoo river, which, falling down from Roraima, has its course marked in a pronounced

* It may here be mentioned that three volumes of admirable original sketches of British Guiana plants by (Sir Robert?) Schomburgk exist in the Herbarium of the British Museum. Among these sketches are to be found many Roraima plants, and among others *Abolboda Sceptrum*.

way by plants characteristic of that mountain, such as *Marcetia taxifolia* [No. 68], *Cassia Roraimæ*, Benth. [No. 71], *Dimorphandra macrostachya*, Benth. [No. 39], *Meissneria microlicioides*, Naud. [No. 174], *Calea ternifolia*, Oliv. [No. 27]. To me the most interesting plant on this river was a very beautiful little slipper-orchid (*Selenipedium Klotzschianum*, Reichb. f. [No. 31]), which grew in the moist gravel of the river-bed, where the plant must frequently be under water. This plant we also found in great abundance on an island in the Cotinga river, on another in the Roraima river, and on a small creek, called Aroie, a tributary of the Cotinga. Naturally the Arapoo river, as are its fellows flowing from Roraima, is an artery allowing of the dissemination of the plants of that mountain.

At last we reached the Kookenaam river, at the village of Teroota, at the base, that is, of Roraima. Even beyond the bed of the river, for some distance up the slope of the mountain, the tract of ordinary savannah vegetation still continues, its characteristic plants ever becoming more and more mingled with plants belonging to the Roraima flora, till the very distinctly marked zone of strictly Roraima vegetation is reached.

The course of the Kookenaam river, where it flows through the tract of neutral vegetation—vegetation, that is, not yet deprived of ordinary savannah plants, and not yet composed exclusively of Roraima plants—is, as was the course of the Arapoo river already described, very well defined by the large number of Roraima plants clustering on its banks. Among these may be mentioned various shrubs, *Ilex Macoucoua*, Pers. [No. 75], *Dipteryx reticulata*, Benth. ? [No. 73], *Myrcia Roraimæ*, Oliv. [No. 74], and another species close to *M. Kegeliana*, Berg [No. 82]) which in places fringe the banks of this stream, and are also characteristic of the upper, proper flora of the mountains. Along the banks of this river, after its emergence from the mountain, grows in the peaty soil at the water's edge a very beautiful and sweet-scented white orchid (*Aganisia alba*, Ridley [No. 360]), and on the more rocky parts of the bank a very remarkable red passion-flower [No. 84], with panicles of many pendent flowers, each panicle having the appearance—the *facies*, to use that ugly but convenient term again—of a spray of fuchsia-blossom*. It was here, too, in the deep cuttings made by the river and half filled up with huge blocks of stone which are now overgrown with gnarled trees and shrubs, that one of the most famous of all Roraima plants grows—*Cattleya Lawrenceana*, Reichb. f. [No. 80].

This *Cattleya* is doubtless the one collected by the Schomburgk brothers, and enumerated by Richard Schomburgk as *C. pumila*; for it appears to be the only representative of this genus occurring on this side, at least, of Roraima, and this was the only side visited by the Schomburgks. It grows apparently not high up on the mountain, but on the gnarled tree-trunks, close to the water, in the clefts through which the Kookenaam and some of its small tributary streams flow, at a height of about 3700 to 4000 feet above the sea. At the time of our visit, Mr. Siedel, an orchid collector, having set the natives to work to collect this plant for him, I have seen ten or twelve of these people come into

* This passion-flower is well figured in Schomburgk's drawings, of which mention has already been made.

camp, afternoon after afternoon, each laden with a basket (a good load for a man) full of these lovely plants, many of them then in full flower. One day I myself, having gone down to the Kookenaam to bathe, gathered, just round the small pool I chose for that purpose, two most glorious clumps of this orchid, the better of the two having five spikes of flower, of which one bore nine, each of the others eight, blossoms—in all forty-one of some of the largest and finest-coloured *Cattleya*-flowers ever seen, on a single small plant, the roots of which easily lay on my extended hand*.

Before now dealing with the plants actually of Roraima, it will be convenient to say a few more words as to the form of this south-eastern face of the mountain (woodcut, fig. 2).

From the bed of the Kookenaam at Teroota (3751 feet) the mountain slopes, somewhat gradually though of course not evenly, upward for a distance of about three miles, till a height of 5000 feet is attained. This last-mentioned point is that to which a considerable number of the plants belonging to the ordinary savannah vegetation of Guiana ascend†. From this point the mountain rises, at first somewhat more abruptly and then again more gradually, so as to form, as it were, a terrace about midway up the slope. The upper level of this terrace, which lies at a height of about 5400 feet, is almost everywhere swampy, though here and there a few rocks crop out. This is the place so enthusiastically described by Dr. Schomburgk, on account of the extraordinary richness of its vegetation, as a “botanical Eldorado;” and it was here too, just within the forest which edges this swamp, that we built our house and made our headquarters. It is to this point that the open savannah extends; for above it all is more or less densely forested. Between this swamp, lying along its terrace, is a ravine, and again, beyond this ravine, in which it must be remembered that the forest begins, the mountain slopes up very abruptly to a height of about 6500 feet, to the base, that is, of the actual cliff. In the accompanying diagram (woodcut, fig. 2, p. 257) all up to the ravine is distinguished as the savannah-slope; all above, to the base of the cliff, as the forest-slope. It should also be noted that the forest-slope is not uniformly clad with trees. The lower part is densely wooded, covered, as it were, by dense jungle; next comes a belt of bush, rather than of jungle; while still higher, just under the cliff, the masses of rock which have fallen from above lie like a moraine, on which are scattered sparse trees, the low, wide-spreading branches of which interlock in a remarkable way‡. The actual face of the cliff is, of course, bare; but wherever ledges run up for any distance these are often tree- or bush-clad; and the one ledge which runs right up to the top, the one by which we ascended, is bush-clad to a point about two-thirds up, then bushless but plant-covered.

In the ascent from Teroota up to about 5000 feet (nearly up, that is, to the commencement of the El Dorado swamp) we met with many plants new to me scattered among the

* Full descriptions of this *Cattleya* have been given in the ‘Gardeners’ Chronicle,’ 1885, vol. xxiii. pp. 374, 375, and vol. xxiv. p. 168.

† The most conspicuous of the few plants of the ordinary plain which ascend above this point are:—*Polygala hygrophila*, H. B. K.; *P. longicaulis*, H. B. K.; *P. variabilis*, H. B. K.; *Sida linifolia*, Cav.; *Drosera communis*, A. St.-Hil.; *Pleroma Tibouchinum*, Triana; *Sipanea pratensis*, Aubl.; *Pectis elongata*, H. B. K.; *Gnaphalium spicatum*, Lam.; and *Centropogon surinamensis*, Presl.

‡ This moraine-like part of the slope is curiously like the well-known “Wistman’s Wood” on Dartmoor.

usual savannah plants. Conspicuous among these were three orchids, two growing on bare pebble-covered ground, the third on the huge boulders scattered over the slope. The two former were *Cyrtopodium parviflorum*, Lindl. [No. 55], with its handsome spike, often eighteen inches high, of many yellow and purple flowers, and the delicately beautiful white-flowered *Kellensteinia Kellneriana*, Reichb. f. [No. 61], which latter grows also on the Kaieteur savannah. The third of the above-mentioned orchids was the curious *Masdevallia brevis*, Reichb. f. [No. 286], with flowers more remarkable than beautiful. Another striking new plant also growing on the boulders of this part of the slope was a remarkably handsome and large *Puya* (?) [No. 45], with flowers of a magnificently deep indigo-blue—a colour so rare in the tropics. This *Puya*, Mr. Baker tells me, is probably a new and interesting species, but the dried specimens of it which I deposited at Kew are unfortunately not sufficient for its determination. I have, however, some fine young living plants of the species.

I come now to the description of the El Dorado swamp, for the place is really so remarkable botanically as to be worthy of distinction under this name. It is worth, also, another effort to give some picture of the appearance of the place. The swamp (botanists will understand that the rather dismal suggestions of this word are often, as certainly in this case, undeserved) lies on a terrace midway up the mountain. Its surface is very uneven, and it is consequently much wetter in some parts than in others—its flatter parts and its hollows so saturated with wet that the foot of one who walks there sinks often up to the ankle; its higher parts islands, rarely of any great size, of dry ground scattered through the swamp. Often from these dry islands considerable groups of rocks crop out and sometimes rise to a considerable height. In the wetter parts the grass, which, of course, forms the main vegetation, is everywhere high, rank, and coarse; on the islands of drier ground the grass is finer and even turf-like; from the actual rocks grass is absent. Each of these two aspects of the swamp, wet ground and dry rocky island, presents a distinct vegetation, of which almost the only common feature is distinction from the vegetation outside this El Dorado.

Mingling and vying in height with the rank grass* of the wet parts, their flowers mingling with the blossom of the grasses, are plants of wonderful beauty. The ever lovely violet-flowered *Utricularia Humboldtii*, Schombk. [No. 43], is there, growing, not, as on the Kaieteur savannah, as an epiphyte, but with independent roots in the ground; but of this I shall have more to say presently. The *Abolboda* is there too, in a form slightly larger and much less compact than is natural to it when growing on drier ground. The flag-leaved, yellow-flowered *Xyris setigera*, Oliver [No. 62], and the small pink-flowered *Begonia towarensis*, Klotzsch [No. 141], are also there. A very few plants of *Brocchinia cordylinoides*, Baker, just two or three single specimens, are there; but of this I shall have more to say presently. Various ferns are there, especially the magnificent Cycad-like *Lomaria Boryana*, Willd. (*L. Schomburgkii*, Klotzsch); also many orchids; a "lady's slipper" (*Selenipedium Lindleyanum*, Reichb. f. [No. 53]), with huge-branched flower-stems, each bearing many blooms, the whole plant, flower, leaf, and stem alike, all

* The grasses chiefly noticed at this place were:—*Paspalum stellatum*, Flüge; *Panicum nervosum*, Lam.; *Arun-
dinella brasiliensis*, Raddi.

velvety in texture, and of various shades of one colour, the colour of sunlight as it falls through green young beech-leaves; the beautiful *Zygopetalum Burkei*, Reichb.f. [No. 50]*, with flowers seeming like gigantic, pale-coloured "bee orchises" (*Ophrys apifera*, Huds.), but far sweeter in scent; in great abundance the rosy-flowered *Pogonia parviflora*, Reichb.f. [No. 115], which recalls in habit our English wild tulip (*Tulipa sylvestris*, L.); and, to mention but one more among many, *Epidendrum elongatum*, Jacq. [No. 42], its stems varying in height from one to eight feet, its verbena-like clusters of flowers varying in colour in different plants, some pale yellow, some fawn-colour, many pure rich pink, dark purple, and even mauve. This last-mentioned orchid, it may be noted in passing, is one of a group to which I shall presently refer.

The effect of the whole is as of an Alpine meadow, coloured in early summer by innumerable flowers of the brightest and most varied tints.

If this tall vegetation be anywhere parted by the hand of the curious traveller, underneath it is seen a carpet of other, low-growing, plants—*Pæpalanthus Schomburgkii* [No. 33] and *P. flavescens*, Körw. [No. 60], *Drosera communis*, A. St.-Hil. ? [No. 313], a pretty little orchid, *Spiranthes bifida*, Ridley [No. 342], ferns, Lycopodiums, and sphagnum-like mosses.

One, perhaps the most remarkable, plant of the swamp has not yet been noticed. It is the South-American Pitcher-plant, *Heliamphora nutans*, Benth. [No. 258], which grows in wide-spreading, very dense tufts in the wettest places, but where the grass happens not to be long. Its red-veined pitcher-leaves, its delicate white flowers raised high on red-tinted stems, its sturdy habit of growth, make it a pretty little picture wherever it grows. But it attains its full size and best development, not down here in this swamp, but up on the ledges on the cliff of Roraima, and even on the top.

The vegetation of the drier, rocky patches is very different. A few shrubs of from four to eight feet in height, a very few stunted and gnarled trees are there, a few single specimens of the one Roraima palm (*Geonoma Appuniana*), which, as will presently be told, is much more abundant higher up; but more abundant are very dwarf shrubs of curiously Alpine aspect, such as *Gaultheria cordifolia*, H. B. K. [No. 103], and various trailing plants, such as a blackberry (*Rubus guianensis*, Focke [No. 106]), a passion-flower [No. 110], and a few orchids and ferns.

Of the orchids the most noteworthy is *Oncidium nigratum*, Lindl. [No. 114], its delicately thin, but wiry and much-branched stems, five feet high or more, seeming to float in the air a crowd of innumerable, tiny, butterfly-like flowers of cream-colour and black; but two others (*Zygopetalum Burkei* and *Epidendrum elongatum*), which we have already seen in rank luxuriance in the wetter parts of the swamp, grow also on these drier parts, but are here much reduced in general habit, though with larger and brighter-coloured flowers. Of the ferns the most striking are a beautifully delicately cut *Schizæa* (*S. dichotoma*, Sw. [No. 100]) and a very remarkable *Gymnogramme* (*G. elaphoglossoides*, Baker, [Nos. 101 & 215]), of which more hereafter.

Again, the tiny coppices which are on the swamp and the forest which bounds it—

* This is represented on the Organ Mountains by *Z. Mackaii*, Hook.

which forest, it must be remembered, covers on the other faces of the Roraima slope what is here swamp—are full of interesting trees. One with vast numbers of large magnolia-like white flowers is *Moronobæa intermedia*, Engler [No. 337], the new species already alluded to as very closely allied to a second new species, *M. Jenmani*, Engl., which occurs in corresponding circumstances on the Kaieteur savannah. Another abundant tree represents an entirely new genus, *Crepinella gracilis*, Marchal [No. 162]; another is a new species of *Sciadophyllum* (*S. coriaceum*, March. [No. 128]). Another common, and strikingly beautiful, tree is a variety of *Byrsonima crassifolia*, H. B. K. [No. 130], with leaves the under surfaces of which are tinted with so deep and rich a violet as to impart a very striking violet shade to the whole tree, even when it is seen from a distance. Under the shade of these and the hosts of other trees ground-shrubs and tree-trunks alike are swathed in thick green mosses. There, too, but half clinging to the tree-trunks, are various species of *Psammisia* [Nos. 56 & 49], woody-stemmed creepers, the innumerable drop-like crimson flowers of which, as they catch the tiny gleams of light striking down between the thick leaves of the forest-roof, glow with intense colour. In these shady, moss-covered, quiet places stand erect many tree-ferns [Nos. 92, 270, 87, 37] and a very beautiful new aroid (*Anthurium roraimense*, N. E. Brown [No. 264]), its huge heart-shaped leaves and large arum-like flowers of purest white carried high on a slender but stiff stem. There, too, are innumerable ferns of wonderful interest, and many, but not showy, orchids—especially of the latter family, many of those tiniest and most delicate species which, if seen under a powerful magnifying-glass, would rival the most showy and graceful of their kindred of our hothouses.

We must now pass to the forest-slope, which, as has been said, consists of three fairly distinct belts or zones, which I have called respectively, beginning from the lowest, the jungle-belt, the bush-belt, and the belt of rock and tree.

The jungle is most densely interwoven with many tall shrubs or dwarf trees, which are yet more closely knit together by vast quantities of a climbing, straggling bamboo (*Guadua* [No. 359]), of a cyperaceous plant (*Cryptangium stellatum*, Bœckl. [No. 357], with rough, knife-edged leaves and tall, weak stems, which support themselves on, and at the same time densely clothe, the shrubs among which it grows*, and of a gigantic and handsome climbing fern (*Gleichenia pubescens*, H. B. K. [No. 343]). Among the shrubs also are two palms: one, in vast quantities, very stout and erect-stemmed, and large-leaved, *Geonoma Appuniana*, Spruce [No. 382]; the other, occurring only in a few scattered examples, a *Euterpe*, probably *E. edulis*, Mart., but, if so, in a most remarkably stunted and dwarfed form. It is worth noting here that, despite the reported specific abundance, by Schomburgk and Appun, of palms about Roraima, these are literally the only two plants of that Order which I saw on the mountain. Under the shrubs forming this jungle the ground was everywhere swathed with mosses, closely intermingled with innumerable ferns, especially filmy ferns; and this mossy covering reached up over the tree-stems and branches everywhere but where the sunlight fell. Under the shade of these shrubs, in the darkness and damp, grew various

* This is also a Kaieteur plant.

high-drawn terrestrial orchids, pallid plants with inconspicuous and pale flowers (*Stenoptera viscosa*, Reichb. f. [No. 131]).

Undoubtedly the most striking feature of the vegetation of this jungle-belt was the curious abundance and variety of the Ferns. Of these, two seem to require special mention here. One is the *Gymnogramme* [No. 181] already mentioned as occurring on the rocks in the swamp; it was abundantly distributed from the swamp nearly to the top of the mountain. It will be further mentioned in connection with a closely allied species occurring on the top. The second fern to be distinguished represents a very remarkable new genus, on which Mr. Baker has dwelt at some length in his report on the plants of the expedition. The genus he has called *Endoterosora* [No. 184]; the species he has been good enough to gratify me by naming after my friend the late William Hunter Campbell, LL.D., a man who, for very many reasons, but especially for his constant endeavours to forward the scientific interests of the colony, deserved so well of the people of Guiana. It is perhaps worthy of mention that this plant so closely resembles in outward appearance a form of an entirely different genus (*Polypodium bifurcatum*, L. [No. 184 ex parte]), that I collected and dried it in mistake for that plant. Were it possible to conceive that this resemblance could be of any benefit to the genus *Endoterosora*, it might be supposed that its very close resemblance to *Polypodium bifurcatum* was an instance of 'mimicry.'

Above the jungle-belt comes the bush-belt. Here the shrubs, much fewer in number and so scattered over the ground as to leave wide intervening spaces, appeared to me generally of much the same species as in the lower belt. Here, however, as is not the case below, they are sufficiently distributed to be individually distinguishable. Among them the most prominent are a great number of species of *Psychotria* [Nos. 83, 145, 185, 232], and a very remarkable yellow-flowered *Melasma*, *M. ? spathaceum*, Oliver, n. sp. [No. 210], of which Professor Oliver writes that the specimens supplied him are too imperfect to afford means of final determination whether this should not be regarded as the type of a new genus distinct from *Melasma*; and, in great abundance, a *Croton* (*C. surinamensi*, Muell. Arg., aff. [No. 235]). Here, too, as below, but as is not the case in the jungle-belt, occur a large number of plants of *Brocchinia cordylinoides*, still in its small Roraima, not in its larger Kaieteur form, as well as great quantities of the huge *Stegolepis guianensis*, Klotzsch. [No. 338], the *Iris*-like plants of which, being provided with a great abundance of slimy matter, made walking most difficult, in parts where they grew densely. The *Brocchinia*, too, grew in parts so densely that we had to walk, not on the ground, but on the crowns of the plants, which, as we crushed them with our feet, poured from the axils of their leaves the remarkably abundant water which they retain; and very cold water it was, over our already too cold feet. Nor must I omit to mention, though I propose afterward to sum up my observations on the *Brocchinia* and on the various species of *Utricularia*, that in this bush-belt a very few plants (I saw not more than three or four) of *Utricularia Humboldtii*, Schombk. [No. 43], of the dark Roraima form, were growing in the axils of the *Brocchinia*-leaves, as at the Kaieteur.

Two other very interesting plants appeared to us first in this bush-belt, though we

afterwards found that they extended almost, if not quite, up to the top of the mountain. One, *Lisianthus*, *L. macrantho* aff. [No. 188], was a large succulent-leaved herb, almost shrub-like, with very large rich purple-crimson flowers centred with white, which would probably be a most valuable and gorgeous addition to our cultivated stove-plants. The other was the most delicately beautiful, the most fairy-like, and at the same time, for its size, the most showy plant I ever saw. It was a new *Utricularia*, which Professor Oliver, at my request, has kindly named also after William Hunter Campbell; *U. Campbelliana*, Oliv., n. sp. [No. 187], grew among the very dwarfest mosses clinging to the tree-trunks and boughs. The plant, that is the root and leaves, is so tiny that it was almost impossible to detect it when not in flower. The erect stem, an inch or more high, is hair-like; and on this is borne one (sometimes two) large and brilliant red flower, somewhat of the colour and size of the flowers of *Sophranitis grandiflora*.

One more feature of the bush-belt claims notice; the tree-ferns, occurring, indeed, in the lower jungle-belt, but there crushed out of all form and lost in the too densely packed struggle of plants, are here, in the greater and freer space, able to develop their true form and beauty, and so rise with stout erect stems to bear far overhead their regularly shaped majestic crowns of thickly growing fronds.

Next, of the rock and tree-belt all that need be said is that the same species as in the lower belt seem to occur, but that these are here, for some rather obscure reason, represented by larger and more developed individuals; that the Ferns, both the Tree-ferns and the more dwarf species, and one of the Palms, *Geonoma* [No. 382], become yet more abundant; and that the mossy universal covering which I have already dwelt on as occurring below, here becomes so immensely dense and all-pervading (the Mosses are so deep on rock and ground, and hang in such dense, long masses from all trees and branches) as to produce on the mind of one who penetrates into this remarkable spot, a wonderful and extraordinary effect of perfect and entire stillness, as though, everything being wrapped in so dense and so soft a covering, all sound and all possibility of sound were stilled, deadened, and annihilated.

Just where the rock and tree-belt meet the base of the cliff is a very narrow strip of quite distinct vegetation, so distinct, indeed, that we might almost regard it as a distinct belt, which we might call the bramble-belt. The ground there is covered by a dense thicket of bramble-bushes (*Rubus guianensis*, Focke [No. 106]), in general appearance altogether like English blackberry-bushes. Among this were large masses of the South-American form, appearing very similar to the English form, of the common Bracken, *Pteris aquilina*, L. There, too, were many little bushes of *Marcetia taxifolia*, very strongly suggestive of English heath, and there, also, was a flowering *Laurustinus* (*Viburnum glabratum*, H. B. K. [No. 220]), curiously like the familiar plant of our gardens. To me, after my long stay in the tropics, the whole scene suddenly seemed very home-like and pleasant. But the next minute, as I turned in another direction, the illusion was dispelled by the sight of great thickets of palms (*Geonoma Appuniana*) and a few singly standing and very stately tree-ferns.

Up from the bramble-belt, passing obliquely up the cliff face, ran the ledge by which

we ascended to the top of Roraima. The lower part of the ledge, for perhaps two thirds of its length, is wide, much broken, and very uneven. This part is somewhat irregularly bush-covered. Then the continuity of the ledge is suddenly almost broken by a deep ravine, a part of the rock having been worn away by a stream which falls on to it from the cliff above. The ravine thus made is almost bare of vegetation. Above, the ledge slopes somewhat steeply, but evenly, from the point where it commences again to the top, and this part of it is covered by a dwarf vegetation never more than two or three feet high.

The shrubs on the part of the ledge below the ravine seem to be generally much the same as on the forest slope; but among these a few new ones appear. Among the latter were the very beautiful *Drimys granatensis*, Mutis [No. 242], with its very beautiful white flowers, like pendent wood-anemones, a new and beautiful *Microlicia* (*Microlicia bryanthoides*, Oliver, n. sp. [No. 239]), and several more species of *Psychotria* [Nos. 191, 291]. There, too, was an abundance of the *Lisianthus* [No. 188] already mentioned, and of *Utricularia Campbelliana*.

At the bottom of the ravine into which the stream falls the rocks are bare but for a large number of a pretty white-flowered *Myrtus* (*M. stenophylla*, Oliv., n. sp. [No. 324]), which, met with nowhere else, was growing abundantly in the spray of the falling water.

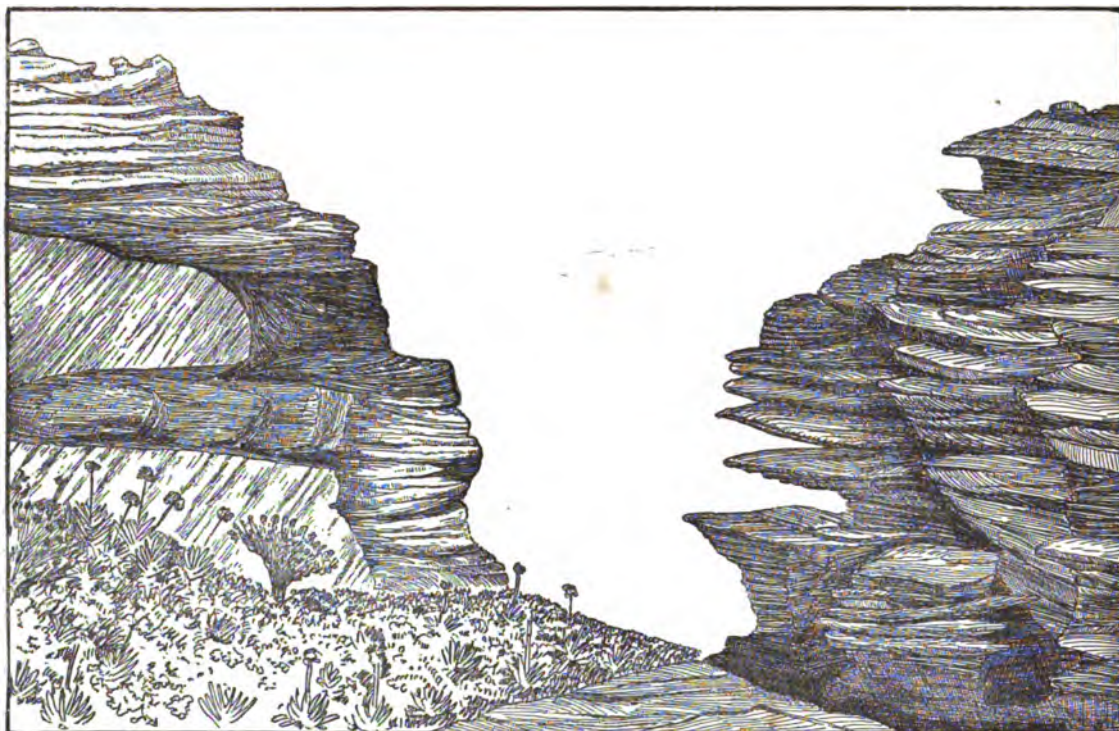
Beyond this ravine, on the upper part of the ledge, the true botanical paradise began. The main vegetation is formed of *Brocchinia cordylinoides*, Baker (in the axils of the leaves of which grows *Utricularia Humboldtii*), *Abolboda Sceptum*, Oliv., and *Stegolepis guianensis*, Klotzsch [No. 338]. Among these were a great many plants entirely new to me and of most striking beauty. Many of these were shrubby, but of so diminutive a character as to be strictly alpine. Of these, by far the most beautiful was a wonderful heath-like plant, with dark green-leaved stems, stout and sturdy, but yet seeming almost overweighted by their great load of intensely vivid crimson star-like flowers. This plant [No. 308] Professor Oliver has identified as a *Ledothamnus*, possibly a variety of *L. guianensis*, Meissner, but of much more slender form than is attributed to that plant in Martius's Fl. Brasil. vii. 172.

Another shrublet, in character recalling the "Alpine rose" (*Rhododendron ferrugineum*), bore even more disproportionately large flowers, of an exquisite pink colour. It was a *Befaria*, approaching *B. resinosa*, Mutis [No. 310]. Other tiny shrubs were a white, feather-flowered *Weinmannia* (*W. glabra*, L. fil., var. [No. 244]), a myrtle (*M. n. sp. aff. myricoidi*, H. B. K. [No. 189]), yet another species of *Psychotria* (*P. imThurniana*, Oliver, n. sp. [No. 163]), a *Baccharis* (*B. Vitis-Idæa*, Oliver, n. sp. [No. 241]), and a *Vaccinium* (*V. floribundum*? H. B. K. [No. 329]). On most of these tiny shrubs was growing an appropriately tiny Misseltie, *Phoradendron Roraimæ*, Oliver, n. sp. [No. 323], a miniature of an English plant. Among all these, many other interesting plants occurred. There grew, in far greater luxuriance and size than below, the pitcher-plant, *Heliamphora nutans*, Benth. [No. 258]; also great masses of two species of *Xyris*, *X. Fontanesiana*, Kunth [No. 257], and *X. witsenioides*, Oliv., n. sp. [No. 240], the latter very striking and curious by reason of the *Witsenia*-like habit of their dark green-leaved

stems, with pretty star-like yellow flowers. Lastly, I found a plant with a flower which, because of its form and colour, I at first sight mistook for a fritillary, like our "Snake's-head" (*F. meleagris*); but it was a new *Lisianthus*, which Professor Oliver has named *L. imThurnianus*, Oliv., n. sp. [No. 306]. There grew many small but pretty and bright-coloured orchids—two new species of *Epidendrum* (*E. montigenum*, Ridley, n. sp. [No. 322], and another [No. 304]); also a plant of a new genus of Cryptangiæ named by Mr. Ridley *Everardia* (*E. montana*, Ridley [No. 335]).

So the vegetation of the ledge continued to the top, and indeed actually extended over the top (woodcut, fig. 3).

Fig. 3.



View at the point of entrance of the plateau on the top of Roraima.

The general effect of the vegetation of Roraima, fitly rivalling in this respect the marvellously strange geological aspect of the place, is so strange as to be very difficult of precise description. It occupies more or less wide tracts, generally almost level, between the bare flat rocks and the groups of piled rocks which occupy the greater part of the plateau. In such places it forms a dense carpet of vegetation, which is generally but a few inches, never more than a couple of feet, in height, except where, from its general level, rise a few scattered individuals of the one shrub of any conspicuous height, *Bonnetia Roraimæ*, Oliv., n. sp. [No. 330]—and that was never more than from 30 to 40 inches in height—or the many and very remarkable flower-stems of *Abolboda Sceptum*, Oliv. [No. 312], which, to my great delight, at that height still bore its beautiful blooms, the appearance of which I have already described. Through this carpet of vegetation ran many small streams; and even in other places much water everywhere saturated the turf. A very few small plants also grew in the crevices of the piled rocks, which otherwise were bare of vegetation.

The chief constituents of this turf-like vegetation were vast quantities of a new species of *Pæpalanthus* (*P. Roraimæ*, Oliv., n. sp. [No. 294]), and great masses of *Sphagnum*-like mosses. In the latter grew, in such abundance as to redden the ground, the pretty little Sundew (*Drosera communis*, A. St.-H. [No. 313]). Groups of very luxuriant Pitcher-plants (*Heliamphora*) were there also. Great quantities of tiny shrubs, of alpine character, interwove their branches with each other and with the mosses; among these were *Weinmannia guianensis*, Klotzsch [No. 327], *Marcetia juniperina*, DC. [No. 319], *Psychotria concinna*, Oliv., n. sp. *Baccharis* [No. 241], *Ledothamnus* [No. 308], *Befaria* [No. 310], *Vaccinium* [Nos. 326, 329], *Pernettya* [No. 333, ex parte], and *Gaultheria* [No. 332]. The small *Epidendra*, as on the ledge, were here too, as was also the tiny Misseltie (*Phoradendron* [No. 323]) and the Fritillary-like *Lisianthus* [No. 306].

A beautiful *Tofieldia* (*T. Schomburgkiana*, Oliv., n. sp. [No. 297]) and the somewhat similar *Nietneria corymbosa*, Kl. & Sch. [No. 298], with large yellow flowers, were conspicuous.

In the crevices of the rocks the vegetation was different. There was a very beautiful *Utricularia* (*U. montana*? Jacq. [No. 293]), larger and deeper in colour, but slightly less graceful, than *U. Campbelliana*, and there were three species of fern. One of these latter was a very stunted form of *Lindsaya striata*, Dryand. [No. 301], which, in its ordinary form, is common in many parts of Guiana. The other two were absolutely new—one a *Hymenophyllum*, which Mr. Baker has named *H. dejectum*, Baker, n. sp., [No. 318]; the other a *Gymnogramma* (*G. cyclophylla*, Baker, n. sp. [No. 295], a second species of the same group of this genus to which belongs *G. elaphoglossoides*, Baker, n. sp., [Nos. 101, 215], found on the lower slopes of Roraima. Only one other species of this very distinct group is known, and that has been found in the Amazon valley.

I have now briefly noticed the most striking plants which we met with on Roraima; but, before closing this paper, there are one or two points which I wish, finally, to set down in order.

First, as to *Brocchinia cordylinoides*, Baker; this is only known to occur on the Kaieteur savannah and on Roraima, but in the latter place apparently only above a height of 5500 feet. There is a remarkable difference of vigour in the habit of the plant at these two places respectively. After seeing a large number of individuals of the plant at both places, it is obvious that at the Kaieteur it attains a much greater size and forms a much taller stem; and, if I may judge from the comparative abundance or scarcity of flower-stalks, it seems to flower much more freely at the Kaieteur than on Roraima. A possible explanation of some of these facts seems to be that the position and the circumstances that it finds on Roraima, are beneficial to the plant; that the most important of these circumstances of its existence is an atmosphere, like that of Roraima or of the Kaieteur, so saturated with moisture as to effect the constant replenishment of the large quantity of water retained in the leaf-axils of the plant; and that the plant having found its way to the Kaieteur (which, though much below the proper level, is atmospherically so peculiarly suited for it), it has taken root there and, in its new surroundings of higher temperature, has there developed a new vigour. Lastly, as regards this plant, I cannot refrain from once more alluding to its possible, even probable, distribution in the other widely scattered distinct areas already enumerated.

Closely connected with the *Brocchinia* is *Utricularia Humboldtii*. Like the *Brocchinia*,

this plant grows both at the Kaieteur and on Roraima; but at the former station it apparently *always* grows floating in the water retained in the leaf-axils of the *Brocchinia*, while on Roraima it grows abundantly with its roots in the ground, and only very rarely in close association with the *Brocchinia*. The Roraima plant is, moreover, far more beautiful, its flowers are of a far more intense colour, than is the Kaieteur plant; this latter circumstance is possibly mostly due to the greater vigour which the plant displays when its roots are in the ground. I have already alluded to the occurrence of a very similar *Utricularia* on the Organ Mountains, associated with a huge Bromeliad, just as it is at the Kaieteur with the *Brocchinia*.

Next, the two other large-flowered species of *Utricularia* from Roraima claim notice, *U. Campbelliana* has already been described. It occurs abundantly, but apparently only on the forest-slope and for some distance from this up the cliff.

The other species, *U. montana*, Jacq., aff. [No. 293], appears to occur only in crevices in the rocks on the summit. *U. montana* has been previously recorded from the West Indies, Colombia, and Peru. The two species, though somewhat alike in general character, are, at a second glance, evidently very distinct. *U. Campbelliana* is altogether a more delicate plant; its leaves are much smaller, rounder, and its stems are shorter; its bladders are disk-shaped. The other species is altogether a stouter plant, with longer-stalked strap-shaped leaves and with spindle-shaped bladders.

To one other set of plants I should here like to call attention. These are represented from among the plants collected during the Roraima expedition by two species of *Epidendrum* (*E. Schomburgkii*, Lindley [No. 13], and *E. elongatum*, Jacq. [No. 42]). These seem to me to be plants, from the dry rocky ground of the interior of the country, which correspond more or less closely with three forms, in a fresh state evidently very distinct, but of which dried herbarium specimens have all been classed under the one name of *E. imatophyllum*, and all three of which occur on trees near the coast. Of these coast-forms, the most distinct is one of constantly bifloral character, which occurs low down on trees overhanging the brackish water at the estuaries of the rivers; another, occurring on the tops of bushes slightly higher up the rivers, is, in general facies and in colour, very similar to the typical *E. Schomburgkii*; and the third, occurring in similar positions, but more sparingly, more nearly approaches in facies *E. elongatum*, but is constantly of a peculiar scarlet colour. The two last-mentioned forms, unlike any of the others, are invariably associated with ants, either because these creatures prefer to make their nests in the roots of the plants, or because the seeds of the plants find their most suitable nidus, and germinate, in the ants' nests.

[NOTE.—The following determinations and descriptions of new plants were expressly drawn up for publication in the 'Transactions of the Linnean Society,' a confidential copy being given to Mr. E. F. im Thurn to help him in writing the foregoing Introduction. During the delay required to prepare the accompanying Plates, Mr. im Thurn has taken the unprecedented course of printing the whole of the unrevised draft, at Demerara, in 'Timebri, the Journal of the Royal Agricultural and Commercial Society of British Guiana,' vol. v. pp. 145–223 (Dec. 1886), thus forestalling the present publication.—
SEC. L. S.]

II. *List of the Species of Plants collected, and Determinations of those that are new.* By Prof. OLIVER, F.R.S., F.L.S.

242. *DRIMYS GRANATENSIS*, Mutis. Ledge.

40. *GUATTERIA*. In the absence of fruit, may be referred to *G. Ouregou*, Dun. Arapoo R.

258. *HELIAMPHORA NUTANS*, Benth. 5400 ft. and top.

96, 151. *SAUVAGESIA ERECTA*, L. forma. 5400 ft.

309. *LEITGEBIA IMTHURNIANA*, Oliv., sp. nov. (Plate XXXVII A. figs. 1-8); floribus distincte pedicellatis, coronæ squamulis oblongo-spathulatis antheris æquilongis v. longioribus.—Roraima: ledge and summit.

Caulis plus minus ramosus, pennæ corvinæ crassitie. Folia imbricata, coriacea, oblanceolata, acutiuscula, apicem versus utrinque 2-3-crenato-denticulata, glabra, oblique nervosa, $\frac{1}{3}$ poll. longa; stipulæ scariosæ, fimbriatæ. Flores ad apices ramulorum, $\frac{1}{2}$ – $\frac{3}{4}$ poll. diam., pedicello $\frac{1}{3}$ poll. longo, 2-3-bracteolato, bracteolis anguste linearibus, stipulatis, stipulis lineari-subulatis longe ciliatis. Sepala lineari-lanceolata, acuta, rigidiuscula, $\frac{1}{4}$ poll. longa. Petala obovata, integra, $\frac{1}{3}$ poll. longa. Corona basi filamentis coalita, squamulis 5 obtusis, coloratis. Ovarium glabrum, in stylum attenuatum.

Allied to *L. guianensis*, Eichl., but much more slender, with the flowers distinctly pedicellate, and the coronal squamæ equal to or overtopping the anthers.

26. *POLYGALA HYGROPHILA*, H. B. K. Arapoo R.

97. *P. LONGICAULIS*, H. B. K. 5400 ft.

252. *P.*, an *P. VARIABILIS*, H. B. K. var.? 5400 ft.

79. *QUALEA SCHOMBURGKIANA*, Warm.? By Teroota.

337. *MORONOBIA INTERMEDIA*, Engl., sp. nov.; ramulorum internodiis brevibus; foliis crassis, valde coriaceis, concoloribus, obovato-oblongis, in petiolum brevem canaliculatum angustatis, nervis lateralibus numerosis, patentibus, subtus paulum prominulis; floribus breviter pedicellatis, sepalis 5 suborbicularibus, cinerascentibus; petalis quam sepala circ. sexies longioribus; staminum phalangibus 5-andris, superne tantum leviter spiraliter tortis, petala fere æquantibus; ovario oblongo-ovoideo in stylum duplo brevioris stigmatibus 5-fido coronatum attenuato.

Roraima.

Omnino intermedia inter *Moronobeam ripariam* et *Moronobeam Jenmanni*, a priori non nisi foliis paullo majoribus et nervis minus prominulis, ab altera floribus duplo minoribus, ab utraque phalangibus andrœcei minus tortis diversa.—Engler.

72. *MARCGRAAVIA CORIACEA*, V.?, vel *UMBELLATA*, L. (imperfect). Near house, 5400 ft.

11. *BONNETIA SESSILIS*, Benth. Between Ireng and Cotinga R.

Label misplaced or missing. *B. PANICULATA*, Spreng.?

330. *BONNETIA RORAIMÆ*, Oliv., sp. nov. (Plate XXXVII. B. figs. 9-17); foliis coriaceis, parvis, oblanceolatis v. obovato-oblongis, obtusiusculis, apicem versus obscure denticulatis, eveniis, brevissime crassiuscule petiolatis; floribus ad apices ramulorum sessilibus bracteatis; sepalis late ellipticis, obtusis, breviter apiculatis, ciliolatis; petalis calyce longioribus cuneato-obovatis, truncatis v. leviter emarginatis; filamentis brevibus, basi in phalangibus 5 coalitis; antheris obovato-turbinatis, emarginatis; ovario in stylum crassiusculum apice 3-fidum angustato.

Summit of Roraima.

Folia conferta, imbricata, 4-7 lin. longa. Flores $\frac{1}{3}$ - $\frac{1}{2}$ poll. diam.

A very distinct species, of which our material is rather imperfect.

8. *MAHUREA EXISTIPULATA*, Benth. Aroie Creek.

288. *TERNSTREMIACEA* ? (inadequate). Path to upper savannah.

22. *SIDA LINIFOLIA*, Cav. Arapoo R.

130. *BYRSONIMA CRASSIFOLIA*, H. B. K., var. ? Near house.

136. *TETRAPTERIS* ? (no fruit). Near house.

255. *TETRAPTERIS RHODOPTERON*, Oliv., sp. nov.; ramulis appresse sericeis; foliis petiolatis, obovato- v. oblanceolato-ellipticis, breviter apiculatis, basi cuneatis, utrinque tomentello-pubescentibus, supra glabrescentibus; racemis folio brevioribus, sericeis; bracteis brevissimis, ovatis, bracteolis medio pedicelli insertis, obovatis v. late ellipticis, bractea majoribus; calyce 10-glanduloso, sericeo; samaræ alis lateralibus a basi divaricatis, coriaceis, nervosis, glabris, rubescentibus, obtusis, integris v. interdum inæqualiter dentatis.

Roraima.

Folia $2\frac{1}{2}$ -3 poll. longa, $1\frac{1}{8}$ - $1\frac{1}{2}$ poll. lata: petiolus $\frac{1}{4}$ - $\frac{1}{2}$ poll. longus. Bracteolæ geminatae, $\frac{1}{10}$ - $\frac{1}{8}$ poll. longæ. Samara alis longioribus $\frac{1}{2}$ poll. longis.

211. *RAVENIA RUELLIOIDES*, Oliv., sp. nov. (Plate XXXVIII. A. figs. 1-6); ramulis appresse pubescentibus; foliis unifoliolatis, petiolatis, ovalibus, utrinque attenuatis v. basi obtusis, apice obtusiusculis, nervo medio utrinque cum petiolo appresse pubescente; pedunculis in axillis superioribus 2-vel 1-floris; sepalis 2 exterioribus majoribus, ovatis v. oblongo-ovatis; petalis longe coalitis, tubo corollæ calyce 4-5-plo longiore, leviter curvato; lobis ovatis lanceolatisve; antheris 2 fertilibus, basi appendiculatis.

Roraima, upper slope.

Folia $1\frac{1}{4}$ - $2\frac{1}{2}$ poll. longa, 5-12 lin. lata; nervis subtus obliquis, prominulis; petiolo 2-3 lin. longo. Flores 1- $1\frac{1}{4}$ poll. longi; corolla sericea. Calyx sepalis exterioribus $\frac{1}{4}$ - $\frac{1}{2}$ poll. longis. Antheræ appendicibus brevibus, reflexis, obtusis, obovatis v. truncatis.

Closely simulating some *Acanthacea*, with its opposite, simple (unifoliolate) leaves, and long curved corolla-tube, sheathed at the base by the unequal sepals. The reflexed, somewhat fleshy appendage at the base of the perfect anthers has not, I believe, been observed in the two other described species of the genus.

15. Fruiting specimen, leafless, of a *Pæcilandra*?, and flowering specimen of *Gomphia guyanensis* (*Ouratea*, Aubl.)? Arapoo R.
75. *Ilex MACOUCOUA*, Pers. forma? 3500 ft.
- 107, 331. *Ilex RETUSA*, Kl. 5400 ft. and ledge.
35. *CYRILLA ANTILLANA*, Michx. Arapoo R.
334. *CYRILLA ANTILLANA*, var. *BREVIFOLIA*. Top.
21. *RHYNCHOSIA SCHOMBURGKII*, Benth. Arapoo R.
67. *SWARTZIA*, sp. nov. 5000 ft.
73. *DIPTERYX RETICULATA*, Benth.? (type is too imperfect to be quite sure). Kooke-naam R.
71. *CASSIA RORAIMÆ*, Benth. Arapoo R.
39. *DIMORPHANDRA MACROSTACHYA*, Benth. Arapoo valley.
106. *RUBUS GUYANENSIS*, Focke (ex descr.). "*R. Schomburgkii*, Klotzsch." Base of Cliff.
- 244, 321. *WEINMANNIA GLABRA*, L.f., var.? near *W. humilis*, Engl., but with longer pedicels. Ledge and top.
327. *WEINMANNIA GUIANENSIS*, Klotzsch. Top.
313. *DROSERA COMMUNIS*, A. St.-Hil. var.? Top.
324. *MYRTUS STENOPHYLLA*, Oliv., sp. nov. (Plate XXXIX. A. figs. 1-9); ramosissima, ramulis ultimis gracilibus papilloso-scabridis, foliis patenti-recurvis anguste ovalibus v. lineari-oblongis acutiusculis basi in petiolum angustatis glabris, pedunculis folio brevioribus unifloris axillaribus recurvis apice bibracteolatis, bracteolis linearibus calycis tubo obovoideo obsolete puberulo longioribus, lobis calycis oblongo-lanceolatis obtusiusculis tubo subæqualibus petalis dimidio brevioribus, ovario 3-loculari, ovula in loculis plurima, bacca subglobosa, seminibus reniformibus. Fall on ledge of Roraima, 7500 ft.
Folia circ. $\frac{1}{3}$ poll. longa, $\frac{3}{4}$ - $\frac{1}{2}$ lin. lata; petiolus 1 lin. longus.
189. *MYRTUS*, sp. nov., aff. *M. myricoidi*, H. B. K. Top and upper slope.
74. *MYRCIA* (*AULOMYRCIA*) *RORAIMÆ*, Oliv., sp. nov. (Plate XXXVIII. B. figs. 7-13); ramulis teretibus pilosulo-puberulis glabrescentibus cineraceis, foliis pallidis obovato-ellipticis v. late oblanceolatis obtusis basi cuneatis subtus in nervo obsolete pilosulo, supra demum nitentibus, paniculis pedunculatis axillaribus et subterminalibus, pedunculis pauce pilosulis folio brevioribus v. subæquilongis, floribus breviter pedicellatis, pedicellis pubescentibus calycis tubo turbinato glabro sæpius brevioribus, lobis calycinis brevibus late rotundatis.
Roraima, 3500 ft.
Folia 1-1 $\frac{1}{2}$ poll. longa, $\frac{1}{2}$ - $\frac{3}{4}$ poll. lata, vernatione supra parce pilosula; petiolus 1 $\frac{1}{2}$ -2 lin. longus. Paniculæ cymosæ 1 $\frac{1}{2}$ -2 poll. longæ.
82. *MYRCIA* aff. *M. Kegelianæ*, Berg. 3500 ft.
68. *MARCEZIA TAXIFOLIA*, DC. (ex Tr.), an *M. cordigera*, DC.? Folia ovata basi cordata, marginibus late recurvis. 5400 ft.

174. *MEISSNERIA MICROLICOIDES*, Naud., *M. cordifolia*, Benth., 5400 ft.
 239. *MICROLICIA BRYANTHOIDES*, Oliv., sp. nov. (Plate XXXIX. B. figs. 10-18); fruticulosa ut videtur fastigiatim ramosa, glabra, ramulis ultimis foliiferis acute tetragonis internodiis folio 3-6-plo brevioribus, foliis patulis lineari- vel oblongo-ovalibus obtusiusculis brevissime petiolatis, floribus solitariis breviter pedicellatis ad apices ramulorum 5-meris, lobis calycinis ovato-lanceolatis tubo fere æquilongis persistentibus, antheris majoribus connectivo producto subæquilongis.

Roraima, ledge 6500 ft.

Folia $\frac{1}{2}$ - $\frac{1}{4}$ poll. longa, $\frac{1}{15}$ poll. lata. Flores $\frac{1}{2}$ - $\frac{2}{3}$ poll. diam. Capsula calyce persistente vestita $\frac{1}{8}$ poll. longa, lobis calycis (temp. fruct.) erectis deltoideo-subulatis rigidis.

59. *PTEROLEPIS LASIOPHYLLA*, Tr.
 20. *PLEROMA TIBOUCHINUM*, Tr. (*Tibouchina aspera*, Aubl.). Arapoo R.
 319. *MAR CETIA JUNIPERINA*, DC. Top.
 89. *CENTRONIA CRASSIRAMIS*, Tr. 5750 ft.
 216, 305. *MONOCHÆTUM BONPLANDII*?, Naud. Upper slope and top.
 277. *OXYMERIS* aff. *O. glandulifera*, Tr. (Facies *Miconia pauperula*, Naud.?) Path to upper savannah.
 Closely resembles the above *Miconia*, but our specimen is not good.
 256. *MICONIA FOTHERGILLA*, Naud. House.
 223. *MICONIA*, sp. (inadequate). Path.
 30, 70. *MICONIA DECUSSATA*, Don. Arapoo R.
 222. *MERIANIA*? aff. *M. sclerophylla*, Tr. (Imperfect.) Forest slope, 6000 ft.
 2. *CUPHEA GRACILIS*, H. B. K., var. *MEDIA*.
 4. *PASSIFLORA FÆTIDA*, L., var. *KONKARMO*.

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84. *PASSIFLORA*, sp., e sect. *Murucuia* (ut videtur). Folia petiolata, petiolis pollicaribus apice utroque latere glandula majuscula circulari præditis, laminis $4\frac{1}{2}$ -5 poll. long., $2\frac{1}{2}$ poll. lat., glabris subtus glaucescentibus subcoriaceis late ovato-oblongis acutis basi rotundatis, raro arcuatim nervosis. Pedunculi foliis subæquilongi apice racemosi. Alabastra cylindrato-oblonga acutiuscula. Floris tubus elongatus, obconicus. Sepala petalæque, ut videtur, brevia oblonga obtusa vel rotundata. Corona faucialis e ligulis petaloideis brevibus constans . . . Gynandrophorum gracile cæt. desunt.—*M. T. Masters*.

Roraima.

110. *PASSIFLORA*, sp., e sect. *Astropheæ*? Fruticosa cirrosa. Folia breve petiolata, petiolis. . . . sub $\frac{1}{2}$ poll. long., laminis $2\frac{1}{4}$ poll. long., $1\frac{1}{2}$ poll. lat., coriaceis glabris raro arcuatim venosis oblongis basi apiceque rotundatis. . . . Cirri simplices. . . . Bracteæ. . . . Alabastra oblonga obtusa. Floris tubus brevis tubulato-campanulatus basi haud intrusus. Sepala 5-6 lin. longa oblonga obtusa navicularia extus tomentosa intus maculis linearibus purpureis verrucisque albidis notatis. Petala sepalis conformia parum breviora tenuiora, membranacea, albida maculis purpureis minimis

crebris obsita. Corona faucialis biserialis, series extima e ligulis petalis æquilongis petaloideis, purpureo-maculatis, dolabriformibus, apice obliquis et in acumen longiusculum tortum prolatis, series intima e filis numerosis præcedentibus dimidio brevioribus, capitatellatis. Corona mediana e tubo versus medium assurgens basi membranacea, apice in fila brevia divisa. Corona infra mediana e tubo versus basin emergens annularis, subcarnosa margine deflexa. Tubi facies interna, inter coronas, processibus parvis membranaceis ut videtur dense obsita. . . . cæt. desunt. Gynandrophorum basi ut videtur quinquangulum, angulis anguste alatis, supra medium tumidum ibique puberulum. Antheræ oblongæ obtusæ flavidæ. Ovarium ut videtur oblongum angulatum longitudinaliter costatum puberulum. Stigmata majuscula reniformia.—*M. T. Masters.*

Roraima.

141. *BEGONIA TOVARENSIS*, Klotzsch, var. ?; fructibus breviter alatis. House.

ARALIACEÆ. By M. E. MARCHAL.

CREPINELLA, nov. gen. Flores hermaphroditi. Calycis margo brevis obsolete 4-dentatus. Petala 4 valvata. Stamina tot quot petala, sub disco epigyno explanato superne in stylum sulcatum abeunte inserta, filamentis brevibus et antheris ovatis. Ovarium 1-loculare, 1-ovulatum, ovulo pedulo. Fructus ignotus.

Frutex (?) glaber. Folia digitata. Flores in umbellas compositas terminales digesti. Bracteæ parvæ squamiformes. Pedicelli sub flore continui.

Notwithstanding the absence of fruit, the genus *Crepinella* is very different from other *Araliaceæ* with 1-celled, 1-ovuled ovary, differing from *Eremopanax*, Baillon, *Cuphocarpus*, Decne. & Naud., and *Mastixia*, Blume, in its digitate leaves and umbellate tetramerous flowers.

Dedicated to Mons. Crépin, Director of the Botanic Gardens, Brussels.

162. *CREPINELLA GRACILIS*, March., n. sp. (Plate XL. figs. 1-6); foliis 5-natis, petiolo sulcato basi abrupte dilatato, foliolis breviter petiolulatis, ovato-ellipticis, apice obtusis vel marginatis, basi acutiusculis, margine integerrimis sive revolutis, pergamaceis, costa infra prominente, umbellulis longiuscule pedunculatis, 8-12-floris, pedunculo gracili profunde sulcato superne incrassato; floribus minutis pedicello basi bracteolato 4-plo brevioribus, calycis tubo obconico, 8-sulcato, corolla hemisphærica acutiuscula sulcata, petalis ellipticis, apice leviter incrassatis incurvis, nervia extus impressa notatis, stylo gracili latitudinem disci vix æquante, fructu. . . .

Roraima.

Rami supremi graciles. Petiolus communis circ. 5 cm. longus. Petioluli 6-10 mill. longi. Foliola 4-5 cm. longa atque 3 cm. lata. Pedicelli 5-7 mill. longi.

128. *SCIADOPHYLLUM CORIACEUM*, March., nov. sp. (Plate XLI. figs. 1-8); inflorescentiis foliisque subtus tomento adpresso subferrugineo demum hinc inde deterso vestitis,

foliis digitatis, 5-7-natis, foliolis ellipticis, apice rotundatis v. sæpius leviter emarginatis basi acutiusculis margine integerrimis anguste revolutis crassiusculis coriaceis, supra denudatis, reticulo nervorum densiusculo infra valde prominente, floribus in umbellas duas compositas superpositasque digestis, umbellulis numerosis, 9-12-floris, pedunculo compresso elongato superne dilatato, radiis filiformibus basi bracteolatis, calycis limbo minute 5-dentato, corolla hemisphærica acutiuscula, petalis apice cohærentibus demum a basi secedentibus, staminum filamentis brevibus, stylis in unum sulcatum 5-fidum latitudinem disci epigyni vix æquantem concretis fructu. . .

Roraima.

Allied to *Sciadophyllum japurense*, Mart. et Zucc., but differing in leaves, inflorescence, and style.

Arbor. Rami supremi 2 cm. crassi. Petiolus communis 20 cm. longus. Petioli 2-4 cm. longi. Foliola 11-13 cm. longa atque 4-5 cm. lata. Pedicelli 5-8 mill. longi.

220. *VIBURNUM GLABRATUM*, H. B. K. Base of cliff.

134. *COCCOCYPSELUM CANESCENS*, Willd., var. House.

6. *KOTCHUBÆA* (*Synisoona Schomburgkianum*, Baill.). Aroie Creek.

69. *DECLIEUXIA CHIOCOCOIDES*, H. B. K. House.

29. *SIPANEA PRATENSIS*, Aubl. Arapoo R. •

135. *CEPHAËLIS AXILLARIS*?, Sw. House; upper slope.

83. *PSYCHOTRIA INUNDATA*, Benth. 3500 ft. Upper slope.

145, 232. *PSYCHOTRIA CRASSA*, Benth.? House. Upper slope.

185. *PSYCHOTRIA*, sp. (=Schombk. 1018 B and Appun. 1103). Upper slope.

163, 320. *PSYCHOTRIA IMTHURNIANA*, Oliv., sp. nov. (Plate XLII. A. figs. 1-7.) Glaberrima; ramulis gracilibus internodiis rectis subteretibus, foliis subsessilibus anguste vel lineari-lanceolatis acuminatis basi obtusissimis subcordatisve, costa prominula, nervis secundariis utrinque circ. 10-15 incurvis prominulis nervum marginalem attingentibus cum venulis intermediis, stipulis basi connatis deltoideo-subulatis brevibus, cymis terminalibus pedunculatis 9-15-floris laxiusculis bracteis obsoletis, calycis limbo 4-dentato dentibus deltoideis, corollæ tubo cylindrico limbo 2-plo longiore.

Roraima, upper slope and ledge, 7000 ft.

Folia tenuiter coriacea flavescencia, $1\frac{3}{4}$ - $2\frac{1}{4}$ poll. longa, $\frac{1}{2}$ - $\frac{2}{3}$ poll. lata. Flores 2- $2\frac{1}{2}$ lin. longi; corollæ limbus 2- $2\frac{1}{2}$ lin. diam., lobis ovatis obtusis, tubo intus piloso. Ovarium biloculare.

191, 214. *PSYCHOTRIA*, sp. (Imperfect.) Upper slope and path.

291. *PSYCHOTRIA*? sp. Path to upper savannah.

PSYCHOTRIA CONCINNA, Oliv., sp. nov. (Plate XLII. B. figs. 8-15.) Glaberrima, ramulis gracilibus atro-purpureis, foliis petiolatis parvis coriaceis ovalibus acutis v. acutiusculis, supra costa subprominula nervis lateralibus obsoletis, subtus costa prominente nervis secundariis utroque latere 7-10 prominulis patentim curvatis nervum

marginalem attingentibus, stipulis liberis (utrinque geminatis) e basi crassiuscula erectis subulatis rigidiusculis, floribus in cymis paucifloris parvis breviter pedunculatis terminalibus dispositis, pedicellis brevissimis, calycis lobis minutis ovatis, corollæ tubo recto gracili glabro intus medium versus pilosulo superne leviter dilatato, lobis brevibus ovatis.

Roraima, ledge 6500 ft. and summit.

Folia 7-12 lin. longa, $\frac{1}{4}$ - $\frac{1}{3}$ poll. lata; petiolus 1-1 $\frac{1}{2}$ lin. longus. Cymæ 5-8-floræ. Corolla 6-7 lin. longa (lobi 1 lin.).

66. *PALICOUREA RIPARIA* ?, Benth., forma angustifolia.

85. *PALICOUREA RIGIDA*, Kunth.

90. *RELBUNium* (=Schombk. 646, 984 β). 5400 ft.

23. *EUPATORIUM AMYGDALINUM*, DC. Arapoo R.

No label. *EUPATORIUM*, sp. ? (not identified).

95. *EUPATORIUM CONYZOIDES*, Vahl, var. 5400 ft.

91. *MIKANIA PANNOSA*, Baker. 5400 ft.

16. *PECTIS ELONGATA*, H. B. K. Wai-ireng R.

241, 325. *BACCHARIS VITIS-IDÆA*, Oliv., sp. nov. (Plate XLIII. A. figs. 1-8); ramulis ultimis puberulis, foliis crebris tenuiter coriaceis oblanceolatis obtusis apice 1-3-5-mucronatis in petiolum basi cuneatim angustatis glabris, capitulis campanulato-hemisphæricis 15-20-floris in corymbis terminalibus sæpius sessilibus dispositis, involucri bracteis pauciseriatis, interioribus (in cap. ♀) scariosis anguste lineari-oblongis deciduis, pappo albido.

Roraima, ledge 7300 ft. and summit.

Folia $\frac{1}{2}$ -1 poll. longa, 3-4 $\frac{1}{2}$ lin. lata. Capitula $\frac{1}{5}$ - $\frac{1}{4}$ poll. diam.; bracteis exterioribus ovatis v. ovato-lanceolatis plus minus scariosis margine apicem versus sæpe denticulatis v. minute fimbriatis (in invol. ♂ ut videtur obtusioribus). Achænia lineam longa angulata glabrata; pappus achænio longior, setis circ. 30 minute barbellatis.

Resembles some forms of *B. ligustrina*, DC.

328. *BACCHARIS* aff. *B. cassiniæfoliæ*, DC., an var. ?

63. *ACHYROCLINE FLACCIDA*, DC. 4000 ft.

250. *GNAPHALIUM SPICATUM*, Lam. 5400 ft.

86. *VERBESINA GUIANENSIS*, Baker. 5400 ft.

27. *CALEA TERNIFOLIA*, Oliv., sp. nov. (Plate XLIII. B. figs. 9-16.) Suffrutex scaber, foliis ternatis ellipticis v. ovato- v. obovato-lanceolatis breviter petiolatis late acutatis utrinque apicem versus 1-3-dentatis supra scabris subtus præcipue in costa nervisque setulosis, capitulis circ. 30-floris homogamis pedunculatis ad apices ramulorum umbellatim dispositis, involucri squamis exterioribus herbaceis ovatis v. ovato-oblongis capitula brevioribus, squamis interioribus rigidiusculis late oblongis obtusis striatis, paleis concavis obtusis superne leviter dilatatis, ovariis parce setulosis paleis pappi acuminato-subulatis brevioribus.

Arapoo River.

Folia rigida $\frac{3}{4}$ – $1\frac{1}{2}$ poll. longa, 5–8 lin. lata; petiolus ad 1 lin. longus. Umbellæ 3–5-
cephalæ, pedunculis hispidulis capitulis sæpe paullo longioribus. Capitula late cam-
panulata $\frac{1}{2}$ poll. longa atque lata.

247. ERECHTHITES HIERACIIFOLIA, Raf. 5400 ft.

10. STIFFTIA CONDENSATA, Baker. Near Waetipoo M.

314, 346. CENTROPOGON LÆVIGATUS, A. DC., var. ? Ledge 5400 ft.

77. C. SURINAMENSIS, Presl ? 3500 ft.

56. PSAMMISIA ? sp. (inadequate). 5400 ft.

49. PSAMMISIA, with glabrous smooth purple-brown stem, ovate-oblong, shortly apiculate
quintuplinerved leaves of 4 to 6 in., and contracted umbelliform racemes of flowers
1 in. in length on pedicels of $\frac{1}{2}$ – $\frac{3}{4}$ in. This is probably Schomburgk's nos. 670, 974,
of which corollas are wanting in our example. Whether it be Klotzsch's *P. guya-*
nensis I cannot say.

Roraima, upper slope.

Under the same no. is apparently another *Psammisia* in early bud, with more broadly
elliptical leaves and acute calyx-segments.

109. NOTOPORA SCHOMBURGKII, Hook. f. 5400 ft.

243. SOPHOCLESIA aff. *S. subscandenti* (ovario glabro). Ledge 7300 ft.

329. (333 ?). VACCINIUM, an *V. floribundum*, H. B. K. ? (*V. polystachyum*, Benth.).
Top and ledge.

326 365. VACCINIUM, an *V. floribundum*, H. B. K., var. ? Top.

308. LEDOTHAMNUS GUYANENSIS, Meissner in Mart. Fl. Bras. vii. 172. (Plate XLIV. A.
figs. 1–6.) 172. Var. MINOR; foliis minoribus imbricatis acutis ciliolatis, floribus
sessilibus v. subsessilibus, filamentis anthera 3–5-plo longioribus.

Roraima, upper part of ledge and summit.

Possibly a distinct species, but, as our Schomburgk specimens are more advanced and
scarcely in a comparable state, it is better left as above for the present. The leaves are
only about $2\frac{1}{2}$ lines long (in the type 4 lines), minutely setulose-ciliolate. Flowers 1 to
 $1\frac{1}{4}$ in. in diameter, of vivid crimson. In our type the flowers are on pedicels, of $\frac{1}{4}$ to 1 in.,
but these may perhaps elongate after flowering.

Label missing. BEFARIA GUIANENSIS, Klotzsch.

310. BEFARIA aff. *B. resinosa*, Mutis (sepalis obtusioribus). (2 forms.) Top.

With no. 333. PERNETTYA, near *P. parvifolia*, Benth., and allies (in fruit).

103. GAULTHERIA CORDIFOLIA, H. B. K. 5400 ft.

332. GAULTHERIA aff. *G. vestita*, Benth. (pedicellis longioribus). Top.

137. LUCUMA RIGIDA, Mart. & Eichl. 5400 ft.

108. GRAMMADENIA LINEATA, Benth. 5400 ft.

36. DITASSA TAXIFOLIA, Decne. Arapoo R.

155. *VINCETOXICUM* (*ORTHOSIA*) *HIRTELLUM*, Oliv., sp. nov.; volubile, caule gracili pilis brevibus subpatentibus hirtis, foliis ovali-oblongis rigidiuscule apiculatis, marginibus revolutis, supra hirtellis in sicco rugulosis, subtus præcipue in costa pilis patentibus hirtis, cymis sessilibus v. brevissime pedunculatis pauci- v. pluri-floris foliis brevioribus, floribus subsessilibus v. pedicello calyce vix longiore, corollæ lobis angustis intus hirsutis, coronæ segmentis 5 basi in annulo brevissimo continuo insertis lineari-lanceolatis gynostegium fere æquantibus, stigmate obtuso.

Roraima.

Folia $\frac{3}{4}$ – $\frac{1}{2}$ poll. longa; petiolus $\frac{1}{2}$ poll. longus v. brevior. Flores $\frac{1}{2}$ poll. longi

Very much resembles in general facies *Ditassa pauciflora*.

147. *NEPHRADENIA LINEARIS*, Benth.?

113. *CURTIA* (*Schuebleria tenuifolia*, Don). 5400 ft.

47. *LISIANTHUS AMÆNUS*, Miq. 5400 ft.

306. *LISIANTHUS IMTHURNIANUS*, Oliv., sp. nov. Gracilis, glaberrimus, caule inferne folioso teretiusculo internodiis folio brevioribus utrinque lineis elevatis duabus notatis, foliis coriaceis obovatis ellipticisve obtusis v. obtusiusculis margine anguste revolutis triplinerviis, pedunculo elongato cymis 3-2-floris, floribus longe pedunculatis, calyce ($\frac{1}{4}$ – $\frac{1}{2}$ poll. longo) 5-fido, lobis ovato-lanceolatis acutiusculis, corollæ (2-poll.) tubo leviter dilatato, limbi lobis oblongo-ovatis acutis, filamentis elongatis gracilibus glabris inclusis, antheris oblongo-ellipsoideis inappendiculatis.

Roraima, ledge and summit.

Caulis 1-pedalis erectus v. basi decumbens. Folia $\frac{3}{4}$ – $\frac{1}{2}$ poll. longa, basi in petiolum angustata, $\frac{1}{3}$ – $\frac{1}{2}$ poll. lata. Pedunculus communis 3-6 poll. longus; bracteæ superiores lineares v. ovales. Discus hypogynus.

In our specimens the limb of the corolla looks as though it might remain straight or even slightly incurved in flower.

188. *LISIANTHUS* aff. *L. macrantho*, sed calycis lobis acuminatis corollæ tubum æquantibus. Upper slope.

3. *HELIOTROPIUM* aff. *H. fruticoso*, conf. *H. strictissimum* = Schombk. 185, 283, and 573. Konkarmo.

24. *SOLANUM*, an *S. Convolvulus*, Sendtn. ? (inadequate). Arapoo R.

210. *MELASMA* ? *SPATHACEUM*, Oliv., sp. nov.; scabrum, foliis suboppositis v. inferioribus alternis brevissime petiolatis ovato-ellipticis basi rotundatis v. leviter cordatis dentatis supra scabris, floribus pedunculatis in axillis superioribus pedunculis folio subæquilongis apice bibracteolatis, bracteolis linearibus v. oblanceolatis basi angustatis, calyce alabastro acuminato florifero antice fisso spathaceo, corolla exserta leviter incurva tubo superne leviter dilatato, limbi brevis lobis subæqualibus, lobo postico truncato emarginato, lateralibus obtusissimis, antico obovato-rotundato bifido.

Roraima, upper slope.

Ramuli retrorsum hispiduli. Folia (exsicc. nigrescentia) $\frac{3}{4}$ – $1\frac{1}{4}$ poll. longa, 4–7 lin. lata. Calyx 5-nervius, alabastro oblongo-ellipsoideus apice acuminatus, parce, præcipue in nervis, scabridus, 10–12 lin. longus. Corolla $1\frac{1}{4}$ poll. longa. Stamina inclusa didynama; filamenta glabra; antheræ sagittatæ glabræ dorsifixæ, loculis æqualibus basi apiculatis. Ovarium glabrum.

I have had too imperfect material to determine finally if this plant should be left in *Melasma*, or regarded as the type of a new genus. There are no ripe fruits, and I should like to be more confident about the form of the corolla-lobes and their æstivation.

129. BEYRICHTIA OCYMOIDES, Cham. Circ. 5400 ft.

43. UTRICULARIA HUMBOLDTII, Schombk. 5400 ft.

187. UTRICULARIA (§ ORCHIDIODES) CAMPBELLIANUM, Oliv., sp. nov. (Plate XLIV. B. figs. 7–11); scapo gracili ($1\frac{1}{2}$ – $2\frac{1}{2}$ -pollicari) unifloro sæpius squamis linearibus v. lineari-lanceolatis remotis bracteiformibus instructo, foliis tenuibus obovatis obtusis basi in petiolum angustatis, bracteis ternis ovatis v. oblongo-ellipticis pedicello brevioribus v. æquilongis, calycis lobis ovato-cordatis obtusis, corollæ labio superiore brevi calycem vix superante, labio inferiore amplo rotundato integro, calcari gracili cylindrico acutato incurvo labium corollæ æquante.

Roraima (*Schomburgk*), upper slope.

Folia cum petiolo $\frac{1}{3}$ poll. longa, lamina $\frac{1}{6}$ – $\frac{1}{4}$ poll. lata. Calyx lobis 4–5 lin. longis-latisque. Corolla labio inferiore 1 poll. lato.

293. UTRICULARIA aff. *U. montanæ*, Jacq. (*U. uniflora*, Ruiz & Pav.). Top.

78. UTRICULARIA, an *tenuifolia*, Benj.? 3500 ft.

287. GESNERACEA? In fruit only. Path to upper savannah.

64. TABEBUIA RORAIMÆ, Oliv., sp. nov. (Plate XLV. figs. 1, 2); ramulis ultimis puberulo- vel scabrido-lepidotis, foliis trifoliolatis foliolis oblongo-ellipticis obtusis sæpe mucronulatis, lateralibus breviter petiolulatis, supra glabrata subtus cano-lepidotis nervis conspicuis depresso-areolatis, racemis terminalibus pauci- v. plurifloris, bracteis lineari-spathulatis scaberulis, pedicellis erectis bibracteolatis calyce infundibuliformi lepidoto-puberulo, lobis breviter ovato-rotundatis, corollæ tubo calyce triplo longiore infundibuliformi, limbi lobis patulis late rotundatis.

Roraima, 5000 ft.

Folia petiolata; petiolus (in ramulis floriferis) 1 – $1\frac{1}{2}$ poll. longus; foliola 2 – $3\frac{1}{4}$ poll. longa, 10–16 lin. lata; petiolulus centr. $\frac{1}{4}$ – $\frac{1}{2}$ poll. longus. Flores $3\frac{1}{2}$ –4 poll. longi, limbo $2\frac{1}{2}$ –3 poll. lato.

14. APHELANDRA PULCHERRIMA?, Kunth, v. A. TETRAGONA, Nees. Ireng R.

81. JUSTICIA, sp., = Appun, 1387 (in part.). Kookenaam valley.

52. LIPPIA SCHOMBURGKIANA, Schau.

1. STACHYTARPHETA MUTABILIS, Vahl. Konkarmo.

38. HYPTIS ARBOREA, Benth. Arapoo R.

- 98, 249. *HYPTIS LANTANÆFOLIA*, Poit. 5400 ft.
 111. *COCCOLOBA SCHOMBURGKII*, Meiss. 5400 ft.
 139. *PEPEROMIA*, not identified; material scarcely adequate. 5400 ft.
 140, 196. *PEPEROMIA*, an *P. tenella*, Dietr. ? 5400 ft., and upper slope.
 224. *PEPEROMIA REFLEXA*, Dietr. Upper slope.
 219, 236. *HEDYOSMUM BRASILIENSE*, Mart. ? Upper slope.
323. *PHORADENDRON RORAIMÆ*, Oliv., sp. nov. Flavescens, ramulis teretibus infra nodos interdum compressis crassitie pennæ corvinæ parce hirtellis, foliis lineari-oblongis v. anguste ovalibus acutiusculis, floribus monoicis, spicis 1-articulatis 5-7-floris, baccis ellipsoideis lævibus ? carnosis.
 Roraima, ledge and summit.
 Folia carnosula moderate coriacea parce pilosula v. glabrata basi in petiolum brevem angustata, 5-9 lin. longa, 1-2 lin. lata; internodia $\frac{1}{2}$ -1 poll. longa. Spicæ axillares solitariæ apiculatæ 1-2 lin. longæ; vagina bracteali leviter bidentata v. subtruncata lateraliter compressa.
 Mr. im Thurn's no. 276 (Roraima, path to upper savannah) may be a glabrate form of this plant with rather broader obtuse obscurely mucronulate leaves.
142. *PHYLLANTHUS PYCNOPHYLLUS*, Muell. Arg. Circ. 5400 ft.
 235. *CROTON*, aff. *C. surinamensi*, Muell. Arg. Forest belt.
 76. *SPONIA MICRANTHA*, Sw. 3500 ft.
 58. *BURMANNIA BICOLOR*, Mart. 4000 ft.
 121. *DICTYOSTEGIA OROBANCHOIDES*, Miers. Upper slope.

ORCHIDEÆ. By H. N. RIDLEY, Esq., M.A., F.L.S.

280. *PLEUROTHALLIS STENOPETALA*, Lindl. Upper slope, Roraima.
 183. *STELIS GRANDIFLORA*, Lindl. Upper slope, Roraima.
 285. *STELIS TRISTYLA*, Lindl. Upper slope, Roraima.
 127. *LĒPANTHES* (inadequate). 5400 ft. (our house).
 275. *OCTOMERIA* ? sp. Upper slope.
 289. *MICROSTYLIS UMBELLULATA* ?, Sw.
 279. *MASDEVALLIA PICTURATA*, Reichb. f. Upper slope.
 286. *MASDEVALLIA BREVIS*, Reichb. f. Upper slope.
 57. *BULBOPHYLLUM GERAENSE*, Reichb. f. (Our house, 5400 ft.)
 290. *ELLEANTHUS FURFURACEUS*, Reichb. f. Upper slope.
 274. *EPIDENDRUM TIGRINUM*, Lindl. Upper slope.
 13. *EPIDENDRUM SCHOMBURGKII*, Lindl. Treng River.
 42. *EPIDENDRUM ELONGATUM*, Jacq. (Our house, 5400 ft.)
296. *EPIDENDRUM ALSUM*, Ridley, n. sp. (§ *Eu epidendra planifolia paniculata*.) Caulis

validus, $\frac{1}{4}$ unciam crassus, ramosa. Folia coriacea breviter ovata obtusa, $1\frac{1}{4}$ ad $\frac{3}{4}$ unciam longa, $\frac{3}{4}$ lata, vaginis rugosis vix uncialibus. Panicula abrupte deflexa, ramis duobus flexuosis 1 ad $2\frac{1}{2}$ uncias longis. Flores parvi carnosiusculi, 8 in ramo, dissiti. Bractee ovatae cucullatae subobtusae. Sepala lanceolata carinata. Petala angusta lanceolata quam sepala dimidio breviora, et paulo tenuiora. Labellum cymbiforme, ovatum, cordatum, carnosum. Columna brevis.

Top of Roraima. The affinity of this plant is with *E. frigidum*, Linden.

299. *EPIDENDRUM IMTHURNII*, Ridley, n. sp. (Plate XLVI. A. figs. 1–6.) Caulis gracilis teres parum ramosus ultra 7-uncialis. Folia angusta lineari-lanceolata coriacea carinata, unciam longa, $\frac{1}{8}$ unciam lata, vaginis rugosis. Racemi 2 vel 3, deflexi, vix unciales, sex-flori. Flores parvi, tenues. Bractee ovatae, pedicelli $\frac{3}{4}$ aequantes. Pedicelli $\frac{1}{8}$ -unciales. Sepala lanceolata oblonga obtusa curva, circiter $\frac{1}{8}$ unciam longa. Petala linearia angusta uninervia. Labellum ovatum cordatum cymbiforme, basi angustatum. Columna gracilis paulo recurva. Anthera pileata subconica obtusa. Capsula fusiformis.

Top of Roraima.

322. *EPIDENDRUM MONTIGENA*, Ridley, n. sp. Caulis teres gracilis, ultra semipedalis. Folia elliptica lanceolata mucronata carinata, unciam longa, $\frac{3}{8}$ lata, vaginis $\frac{3}{4}$ -uncialibus rugosis. Racemi deflexi multiflori, haud ramosi, circiter 3 uncias longi. Flores parvi, tenues. Bractee ovatae subacutae patentes. Sepala lanceolata, ovata falcata, $\frac{1}{4}$ unciam longa. Petala angustiora lanceolata. Labellum cymbiforme, late cordatum, carnosum.
- Ledge and top.

51. *EPIDENDRUM DURUM*, Lindl. Our house.

360. *EPIDENDRUM VIOLASCENS*, Ridley, n. sp. (Plate XLVI. B. figs. 7–10.) Caulis semipedalis gracilis foliis distichis tectus. Folia breviter lanceolata crassiuscula recurva, $\frac{1}{4}$ unciam longa, vaginis superiorum violaceis. Panicula erecta gracilis 5-uncialis, ramis paucis tenuibus. Flores pauci perparvi. Bractee lanceolatae breves recurvae. Sepalum posticum lanceolatum obtusum trinerve, lateralia basi connata, et ad basin labello adnata, lanceolata obliqua, apicibus excurvis, trinervia. Petala linearia angusta uninervia. Labellum rotundatum subreniforme, marginibus serrulatis; costae tres elevatae, versus apices attenuatae. Columna crassiuscula.

Top of Roraima.

304. *EPIDENDRUM*, sp. Ledge, 7500 ft.

80. *CATTLEYA LAWRENCEANA*, Reichb. f. From the locality given, I believe this to be *C. pumila*, Schomb., Reise Brit. Guian. p. 1068 (non Hooker). There is a picture of it among Schomburgk's drawings preserved in the British Museum.

Roraima.

55. *CYRTOPODIUM PARVIFLORUM*, Lindl. Roraima, 4000 ft.

61. *KOELLENSTEINIA KELLNERIANA*, Reichb. f. Roraima, 4000 ft.

50. *ZYGOPETALUM BURKEI*, Reichb. f. Our house.

360. *ZYGOPETALUM VENUSTUM*, Ridley, n. sp. (Plate XLVII. figs. 1–6.) *Planta caespitosa, pseudobulbis nullis. Folia bina, evoluta, lanceolata acuta, basi attenuata, subcoriacea, costis tribus elevatis in dorso, 7 ad 8 uncias longa, $\frac{5}{8}$ lata. Scapus lateralis erectus, 13 uncias longus, vaginis 2–3, apicibus obtusis, amplexis, paullo ampliatis remotis. Racemus latus, 10-florus. Flores mediocres, unciam longi et lati. Bractea pedicellis multo breviores, cylindrica, ovata, acuta, inferiores vaginantes. Pedicelli $\frac{1}{2}$ unciam longi. Sepala ovata, lanceolata, subacuta patula. Petala subsimilia, obtusiora et angustiora. Labellum integrum, mentum plicatum, lamina rhomboidea, obtusa, lata. Columna brevis crassiuscula, alis magnis obtusis falcatis, apicibus curvis. Anthera subconica. Stigma semilunare.*

Kookenaam River, 3000 ft.

There is a figure of what seems to be the same species in the drawings made by Schomburgk, preserved in the British Museum. It was obtained at Takootoo, and is represented as having white flowers, with the base of the lip and the mentum yellow and a few faint purple stains towards the apex of the lip, and purple streaks on the face of the column. The fruit is deflexed, oblong in shape. In the absence of a distinct pseudobulb, this plant differs from the rest of the genus, but the flowers are exactly those of *Zygopetalum*.

114. *ONCIDIUM NIGRATUM*, Lindl. 5400 ft. (our house).

12. *ONCIDIUM ORTHOSTATES*, Ridley, n. sp. (*Plurituberculata Homœantha expansa*.) *Pseudobulbus oblongus, 2 uncias longus. Folium lanceolatum oblongum, 3 uncias longum, 1 unciam latum. Scapus elatus validulus rigidus ultra bipedalis. Bractea lanceolata deflexa brevis $\frac{3}{8}$ -unciales. Flores mediocres, iis *O. cæsii* æquantes. Pedicelli $\frac{1}{2}$ unciam longi. Sepala lanceolata subacuta. Petala subsimilia viridia brunneo maculata (ex sicco). Labelli lobi laterales spathulati obtusi, medius basi angustatus rotundatus reniformis emarginatus, cuspidato minuto. Callus, carina lamellas duas breves gerens. Columna brevis stelidiis obtusis magnis dolabriformibus tenuibus. Pedicellus polliniorum elongatus ligulatus, discus oblongus quadratus, margine exteriori erosus. Treng River; also 23, Savannah, *W. H. Campbell* in Herb. Kew.*

19. *SOBRALIA STENOPHYLLA*, Lindl. Spelinicola, Arapoo River.

273. *SOBRALIA* (inadequate). Upper slope, Roraima.

115. *POGONIA PARVIFLORA*, Reichb. f. 5400 ft. (our house).

342. *SPIRANTHES BIFIDA*, Ridley, n. sp. *Tubera elongata clavata. Folia ovata petiolata acuta tenuia parva, lamina semiunciam longa, $\frac{1}{4}$ unciam lata, petiolus vix semiuncialis. Caulis debilis parce pubescens, ferme 10-uncialis; vaginis circiter 9, laxis lanceolatis acuminatis dissitis $\frac{1}{2}$ unciam longis. Racemus densus spiralis, unciam longus. Bractea flores superantes, lanceolata acuminata. Sepala, petala et labellum subsimilia, lanceolata angusta obtusa, marginibus involutis, apicibus bifidis, minute*

papillosa. Petala quam sepala angustiora. Columna brevis. Anthera erecta obtuse acuta. Ovarium breve minute pubescens.

Our house, Roraima.

131. *STENOPTERA VISCOSA*, Reichb. f. (Our house, 5400 ft.)

173. *STENOPTERA ADNATA*, Ridley, n. sp. (Plate XLVIII. A. figs. 1–6.) Tubera plura lanata elongata. Folia tenuia membranacea lanceolata acuta 3 uncias longa, $\frac{1}{2}$ unciam lata. Caulis validulus 17-uncialis superne pubescens, vaginis pluribus dissitis lanceolatis acuminatis usque ad basin fissis, longissima $1\frac{1}{2}$ -uncialis. Racemus multiflorus densus pubescens. Flores parvi resupinati. Bracteæ lanceolatæ acutæ $\frac{3}{8}$ -unciales floribus æquantes. Ovarium breve crassiusculum pubescens. Galea (sepalum posticum petalis adnatum) ovata cucullata obtusa, marginibus fimbriatis. Sepala lateralía oblonga ovata acuta. Labellum ovatum lanceolatum, lobis lateralibus tenuibus erectis vix distinctis, medio linguiformi carnosio, obtuso, supra canaliculato, basi subtus pubescenti. Columna elongata gracilis apice clavata, parte inferiore pubescente.

Upper slope.

9. *PELEXIA APHYLLA*, Ridley, n. sp. (Plate XLVIII. B. figs. 7–11.) Tubera desunt. Folia radicalia nulla, caulina lanceolata acuminata 6 dissita, superiora latiora. Caulis 8-uncialis pubescens præsertim versus basin. Flores pauci, mediocres, albi. Sepalum posticum petalis adnatum, galeam efformans, lanceolatam acuminatam cucullatam, petala quam sepalum breviora. Sepala lateralía lanceolata linearia porrecta marginibus involutis. Labellum cuneatum spathulatum obtusum minute pubescens, submarginatum lobulo obscuro in medio; calcar ad ovarium arcte adnatum. Columna brevissima, rostellum prolongatum oblongum obtusum canaliculatum porrectum. Anthera lanceolata obtusa vix biloculata. Pollinia pyriformia bicrura; discus ovalis rotundatus.

Waetipoo Mountain; also Serra de Piedade, Minas Geraes, Brazil, *Gardner* (no. 5193, "Flowers white," in *Herb. Brit. Mus.*).

46. *HABENARIA PARVIFLORA*, Lindl. (Our house, 5400 ft.) Roraima 251, at 5000 ft.

367. *HABENARIA MORITZII*, Ridley, n. sp. Caulis $\frac{1}{2}$ ad pedalis foliatus. Folia erecta lanceolata acuta dissita, maxima 2 uncias longa, $\frac{1}{4}$ lata. Racemus laxis circiter 15-florus. Bracteæ lanceolatæ acuminatæ. Flores parvi. Sepalum posticum erectum, lateralía deflexa, ovata, lanceolata, mucronata. Petala bifida, lacinia postica erecta anguste linearis lanceolata, quam sepalum posticum paullo brevior, antica anguste linearis obtusa recurva. Labellum trilobum, lobi laterales filiformes quam medius longiores et angustiores. Calcar filiforme clavatum $\frac{1}{4}$ unciam longum. Columna majuscula. Anthera obtusa, apices breves recti. Lobi stigmatici crassiusculi obtusi breves.

At 4000 ft., Roraima; also in Venezuela, *Moritz* 630 b.

53. *SELENIPEDIUM LINDLEYANUM*, Reichb. f. (Our house, 5400 ft.) Roraima.

31. *SELENIPEDIUM KLOTZSCHEANUM*, Reichb. f. Colunga River.

- 315 or 311 (2 labels). *TILLANDSIA STRICTA*, var. ?
 316. *TILLANDSIA*, sp. ? Inadequate.
 45. *PUYA* (probably new). (Inadequate.)
 366. *CIPURA PALUDOSA*, Aubl.
 28. *SISYRINCHIUM ALATUM*, Hook.
 298. *NIETNERIA CORYMBOSA*, Klotzsch & Schomb. Top.

J. G. Baker.

297. *TOFIELDIA SCHOMBURGKIANA*, Oliv., sp. nov. (Plate XLIX. A. figs. 1-6); foliis elongato-linearibus longe acuminatis minutissime ciliolatis longitudinaliter striatis basi distiche vaginantibus, scapo erecto tereti glabro foliis longioribus, floribus strictis racemosis pedicello erecto subæquilongis, calyculi bracteolis ovatis acutis perianthio 6-plo brevioribus, segmentis perianthii erectis oblongis acutis valide 5-7-striatis.

Roraima, 6000 ft., *Schomburgk*; summit, *E. F. im Thurn*.

Folia 3-12 poll. longa, $\frac{1}{8}$ - $\frac{1}{4}$ poll. lata. Scapus $\frac{1}{2}$ -2 ped. longus, 5-9 (3- ∞)-florus. Flores flavido-virentes semipollicares; perianthii segmenta temp. florif. acutata persistentia rigida. Bractee ovato-lanceolatæ appressæ.

Nearly allied to *T. falcata*, Pers. (*T. frigida*, H. B. K.), from which it differs in its strict inflorescence and longer pedicels and flowers.

Schomburgk describes the leaves as margined with red.

257. *XYRIS FONTANESIANA*, Kunth. 5400 ft.

62. *XYRIS SETIGERA*, Oliv., sp. nov. (Plate L. A. figs. 1-8.) Subcaulis, foliis linearibus setoso-acuminatis marginibus minutissime setuloso-scabridis, scapo foliis 4-5-plo longiore stricto gracillimo subtereti glabro, capitulo ovoideo paucifloro bracteis coriaceis obtusis ovatis v. ovato-ellipticis, staminodiis ad faucem corollæ insertis bipartitis penicillatis, antheris filamentis libero longioribus.

Roraima, 4000 ft., *E. F. im Thurn*.

Folia 1-2 poll. longa, $\frac{1}{4}$ - $\frac{1}{20}$ poll. lata. Scapi 5-7 poll. longi, 1 v. 2 ex una radice; vagina carinata angusta foliis paullo longior. Bractee interiores cymbiformes oblongo-ellipticæ obtusæ v. emarginatæ, $\frac{1}{4}$ poll. longæ. Sepala lateralibus linearibus complicata anguste carinata, carina obsolete denticulata.

240. *XYRIS WITSENIoides*, Oliv., sp. nov. (Pl. L. B. figs. 9-15.) Caulescens, caule decumbente sub scapo sæpius dichotomo, foliis rigidis distiche arcte imbricatis linearibus longitudinaliter striatis glabris ad apicem acutissimum gradatim angustatis, basi vaginante scariosa spadicea, scapo gracili foliis 3-5-plo longiore, capitulis paucifloris, bracteis glabris obtusis v. interioribus majoribus emarginatis, sepalis lateralibus incurvis rigidis carinatis carina scabriuscula, staminodiis flabellatim dilatatis longe penicillato-plumosis, ovario apice rostrato, rostro persistente.

Roraima, ledge 7300 ft., *E. F. im Thurn*.

Folia $2\frac{1}{2}$ poll. longa, 1 lin. lata, leviter falcatis incurva. Scapus in dichotomiis solitarius compressiusculus v. subangulatus, 6-9 poll. longus; vagina foliis brevior. Capitula $\frac{1}{2}$ poll. longa, bracteis haud arcte imbricatis.

Singular in the *Witsenia*-like habit of its stout stems; in our specimens 3–4 inches (ranging to 6–8 inches, *E. F. im Thurn*) in length, lateral branches being given off immediately under the solitary scapes.

312. *ABOLBODA SCEPTRUM*, Oliv., sp. nov.; foliis lineari-lanceolatis acutis rigidis læte viridibus leviter glaucescentibus, scapo crassitie pennæ anserinæ, floribus capitatis, capitulis floriferis 4–5 poll. diam., bracteis ovatis acutis rigidis sepalis $\frac{1}{2}$ – $\frac{3}{4}$ brevioribus, sepalis ovato-lanceolatis subæquilongis lateralibus carinatis, petalis limbo ovato flabellatim venoso, ovario ovoideo, stylo longo basi appendicibus 3 crassiusculis arcte uncinatis ovario æquilongis circumdato, ovula plurima.

Roraima, summit, *E. F. im Thurn*.

Folia 6–7 poll. longa. Scapus Bracteæ ovatæ v. interiores ovato-lanceolatæ, $\frac{3}{4}$ – $1\frac{1}{2}$ poll. longæ. Sepala $1\frac{1}{3}$ – $1\frac{3}{4}$ poll. longa. Petala 2– $2\frac{1}{2}$ poll. longa, inferne in tubum leviter curvatum coalita. Stamina petalis breviora; filamenta anguste linearia; antheræ lineares. Ovarium cartilagineum, $\frac{1}{4}$ poll. longum; stylus $1\frac{3}{4}$ poll. longus.

The leaves I have not seen, Mr. im Thurn having kindly supplied me with a note of their size and form. He describes the foliage as “Yucca-like.” Our specimen consists of a well-developed capitulum and 8–9 inches of its scape. The flowers hardly admit of being satisfactorily analyzed. They are very much larger than in other species seen by me, and the tube of the united petals much wider. The singular uncinat appendages are inserted with the style upon the ovary, not, as in some species, at a distinct interval above it. There is a figure of this remarkable plant in the Schomburgk collection of drawings at the British Museum.

338. *STEGOLEPIS GUIANENSIS*, Klotzsch. 6000 ft.

34. *ERIOCAULON HUMBOLDTII*, Kunth? (= specimen from Roraima, *Schomburgk*). Arapoo R.

33. *PÆPALANTHUS SCHOMBURGKII*, Klotzsch. Arapoo R.

60. *PÆPALANTHUS FLAVESCENS*, Koern. (*eriocephalus*, Klotzsch). 4000 ft.

294. *PÆPALANTHUS RORAIMÆ*, Oliv., sp. nov. (Plate XLIX. B. figs. 7–14.) Acaulis, foliis dense rosulatis brevibus rigidis linearibus obtusiusculis basi latioribus leviter falcatis rectisve, basi arcte imbricata lanuginosa excepta glabra, longitudinaliter striata, scapo solitario vaginato, vagina foliis subduplo longiore spathacea v. bifida glabra, involucri bracteis lineari-lanceolatis glabratibus v. parce pilosis, fuliginosis, bracteis disci flores stipantibus oblanceolatis v. obovato-cuneatis cymbiformibus.

Roraima, summit, *E. F. im Thurn*.

Folia $\frac{3}{4}$ –1 poll. longa. Scapus glabrescens v. apicem versus obsolete puberulus $3\frac{1}{2}$ – $4\frac{1}{2}$ poll. longus. Capitula hemisphærica $\frac{1}{2}$ poll. diam. Flores breviter pedicellati. Perianthium segmentis exterioribus liberis obovatis concavis apicem versus coloratis interioribus staminigeris subæquilongis. Ovarium triquetrum.

264. *ANTHURIUM RORAIMENSE*, N. E. Brown, sp. nov.; cataphyllis magnis lanceolatis, petiolis teretibus elongatis, lamina cordata subacuminata, lobis posticis semioblongis

quam antico subtriplo brevioribus sinu parabolico sejunctis, nervis primariis 13, venis primariis costa utrinque 6-7, omnibus supra et subtus prominentibus; pedunculo valido tereti; spatha oblongo-lanceolata, filiformi-acuminata; spadice stipitato spatha subæquante valido.

Hab. Roraima, British Guiana, *E. F. im Thurn*.

Cataphylla minora 3 poll. longa, majora 7-8 poll. longa, 1-1½ poll. lata. Petiolus 2 ped. longus. Lamina 20 poll. longa, 12 poll. lata, pergamentacea, reticulato-venosa, nervi intramarginali margine valde approximato. Spatha 5½ poll. longa, 1½ poll. lata. Spadix (cum stipite ½ poll. longa) 5 poll. longus, ½ poll. crassus. Flores 1 lin. diam., stylo conico brevissime exserto.—*N. E. Brown*.

382. GEONOMA APPUNIANA, Spr.

358. EUTERPE. 5400 ft.

CYPERACEÆ. By H. N. RIDLEY, Esq., M.A., F.L.S.

259. FIMBRISTYLIS HISPIDULA, Kunth. (Our house, 5400 ft.) Roraima.

245. RHYNCHOSPORA GLAUCA, Vahl. (Our house, 5400 ft.)

253. RHYNCHOSPORA CAPILLACEA, Torrey. (Our house, 5400 ft.)

RHYNCHOSPORA LEPTOSTACHYA, Bœckl. (Our house, 5400 ft.)

248. SCLERIA HIRTELLA, Swartz.

209. SCLERIA BRACTEATA, Cavanilles.

357. CRYPTANGIUM STELLATUM, Bœckeler, ♂. (Plate LI. figs. 1-6.) Upper slope, Roraima.

The male plant of this species does not seem to have been hitherto met with or described; I therefore add a description of it.

Panicula longissima, ramis gracilibus. Spiculæ plures, binæ, castaneæ, ¼ unciam longæ. Bractea lanceolata, trinervis, longe mucronata, mucrone ciliato. Glumæ vacuæ 8, floriferæ 2. Stamina tria, apiculis longis acuminatis, dimidio antheræ æquantibus.

EVERARDIA, nov. gen. *Cryptangiearum*.

Herba perennis, caule valido descendente lignoso. Folia conferta rigida recurva. Culmus paniculatus validus lateralis, ex axilla folii inferioris oriens. Panicula laxa, rami plurimi inferiores masculi, supremi feminei. Spiculæ masculæ plurifloræ, glumis vacuis 3, floriferis 6. Stamina plura. Spiculæ femineæ parvæ, glumis vacuis 4, florifera 1. Stylus brevis, stigma bifidum lobis brevibus planis lanceolatis. Ovarium triangulatum breviter pedicellatum, cupula nulla. Setæ hypogynæ copiosæ tortæ.

335. EVERARDIA MONTANA, Ridley, n. sp. (Plate LII. figs. 1-8.) Caulis brevis, vaginis latis decompositis superne tectus. Folia lineari-lanceolata acuta acuminata carinata recurva, marginibus albo-ciliatis, longissima 7 uncias longa, ½ unciam lata. Culmus 14 uncias longus, validus, compressus, anceps, pro maxima parte paniculata, efoliata, vaginis paucis brunneis fissis compressis, sæpius lamina parva lanceolata obtusa

rigida. Spiculæ masculæ singulæ, copiosæ, $\frac{3}{8}$ unciam longæ, castaneæ, inferiores pedunculatæ. Glumæ 3 vacuæ, staminiferæ 6, lanceolatæ aristatæ, marginibus parce ciliatis, arista brevis crassiuscula. Stamina in flore circiter 6. Anthera acuminata filamentis æqualis, $\frac{1}{4}$ unciam longa, apiculus brevissimus, trichomatum fasciculo terminali brevi. Spiculæ femineæ parvæ angustæ. Glumæ vacuæ 4, suprema fertilis, exteriores cartilagineæ lanceolatæ brevi-aristatæ, castaneæ, interiores scariosæ, carina violacea. Stylus stigmati æqualis, teres, crassiusculus brevis. Stigma breviter bifidum lobis lanceolatis obtusis planis, violaceis. Ovarium ellipticum oblongum obtuse triquetrum breviter pedicellatum, pedicello subtereti. Setæ hypogynæ, copiosæ, tortæ. Pistillum $\frac{1}{4}$ -unciale; caryopsis fere $\frac{1}{8}$ unciam longa.

Ledge, Roraima.

This genus is most nearly allied to *Lagenocarpus*, but differs entirely from that genus, and from the rest of the *Cryptangieæ*, in the lateral inflorescence, the bifid stigma, with short flat lobes, the absence of any cupule, and the presence of a large number of hypogynous bristles.

- 262. PASPALUM STELLATUM, Flügge, var. ?
- 261. PANICUM NERVOSUM, Lam. ? 5400 ft.
- 254. ARUNDINELLA BRASILIENSIS, Raddi. 5400 ft.
- 154. ECHINOLÆNA SCABRA, H. B. K. 5400 ft.
- 246. SACCHARUM (§ ERIOCHRYSIS) CAYENNENSIS, Beauv. 5400 ft.
- 260. ISCHÆMUM LATIFOLIUM, Kunth. 5400 ft.
- 359. ? GUADUA (barren). 5400 ft.
- 18. ? CHUSQUEA (barren). Arapoo R.
- 302. GRAM. DUB. (barren). Top.

FERNS. By J. G. BAKER, F.R.S., F.L.S.

The following is a complete list of the Ferns collected. The numbers are Mr. Thurn's collecting-numbers. Those enclosed within brackets indicate the position of the new species in the sequence followed in our 'Synopsis Filicum.' In determining the species I have had the kind help of Mr. Jenman, the government botanist of the colony, who has paid special attention to Ferns ever since he has lived in Demerara.

- 343. GLEICHENIA PUBESCENS, H. B. K., var. (G. LONGIPINNATA, Hook.). Upper slopes of the mountain.
- 92. CYATHEA VESTITA, Mart. In the neighbourhood of the encampment.
- 270. ALSOPHILA BIPINNATIFIDA, Baker. With a slender caudex 6 or 7 feet in length, in the neighbourhood of the encampment.
- 87 (16*). ALSOPHILA MACROSORA, Baker, n. sp.; stipitibus basi paleis linearibus brunneis imbricatis dense vestitis, frondibus amplis deltoideis tripinnatifidis crassiusculis

præter venas primarias faciei superioris glabris, pinnis oblongo-lanceolatis, pinnulis lanceolatis inferioribus distincte petiolatis basi truncatis ad costam alatham pinnatifidis, segmentis tertiariis oblongis crenulatis, venis simplicibus erecto-patentibus 5-6-jugis, soris magnis globosis superficialibus intramarginalibus, receptaculis dense paraphysatis.

Basal paleæ extending 4-5 inches up the stipe, glossy, moderately firm in texture, the largest $\frac{1}{2}$ in. long. Stipe a foot long, brownish, deeply grooved down the face. Lower pinnæ 15-18 in. long, 8-9 in. broad. Lower pinnules 4 in. long $\frac{3}{4}$ in. broad, with a petiole $\frac{1}{8}$ in. long, which is articulated at the base. Tertiary segments $\frac{1}{8}$ in. broad.

Allied to the Bahian *A. præcincta*, from which it differs by its more coriaceous texture, crowded sori, and densely paraphysate receptacle.

37. *ALSOPHILA VILLOSA*, Presl.

318 (16*). *HYMENOPHYLLUM DEJECTUM*, n. sp.; stipitibus productis paleis pallidis ascendentibus lanceolatis præditis, frondibus oblongo-lanceolatis tripinnatifidis erectis glabris, pinnis lanceolatis confertis decurvatis pinnulis, superioribus simplicibus inferioribus profunde pinnatifidis, segmentis ultimis linearibus integris uninervatis, soris breviter pedicellatis ad basin segmentorum ultimorum impositis, involucre campanulato valvis argute serratis.

Rootstock not seen. Stipes 2-3 in. long, clothed with minute inconspicuous pale membranous paleæ, as is also the rhachis. Lamina 4-5 in. long, $\frac{3}{4}$ -1 in. broad. Pinnæ decurved, not more than $\frac{1}{2}$ - $\frac{3}{4}$ in. long. Final segments $\frac{1}{12}$ - $\frac{1}{8}$ in. long, not more than $\frac{1}{8}$ line broad. Involucre $\frac{1}{8}$ line broad.

A very distinct novelty. Allied to *H. demissum* and *H. javanicum*.

118, 199, 374. *HYMENOPHYLLUM POLYANTHOS*, Sw. Upper slope of the mountain.

207, 302, 370, 372, 373. *HYMENOPHYLLUM MICROCARPUM*, Hook. Upper slope of the mountain. This is evidently not more than a variety of *H. polyanthos*.

205. *HYMENOPHYLLUM CRISPUM*, H. B. K. Upper slope of the mountain.

203, 375. *HYMENOPHYLLUM LINEARE*, Sw. Upper slope of the mountain; and 200, var. *ANTILLENSE*, Jenman.

292. *HYMENOPHYLLUM FUCOIDES*, Sw. Upper slopes of the mountain.

271. *TRICHOMANES MACILENTUM*, Van den Bosch. Upper slopes of the mountain. Will have, I think, to be regarded as not more than a variety of *T. Bancroftii*.

198, 201, 349. *TRICHOMANES PYXIDIFERUM*, L. Upper slopes of the mountain. 349 represents the variety *T. cavifolium*, C. Müll.

99, 347. *TRICHOMANES CRISPUM*, Sw. The higher number from the upper slopes of the mountain, the lower from the neighbourhood of the encampment.

119. *TRICHOMANES RIGIDUM*, Sw. Neighbourhood of the encampment.

120. *DAVALLIA IMRAYANA*, Hook. Upper slopes of the mountain.

344. *LINDSAYANA GUIANENSIS*, Dryand. Upper slopes of the mountain.

- 149, 150, 301. *LINDSAYA STRICTA*, Dryand. The two lower numbers gathered near the encampment, the other on the mountain-top.
- 161, 303. *HYPOLEPIS REPENS*, Presl. Base of the cliff. 194, 195 are young forms of *Hypolepis*, most likely the same species.
144. *PTERIS LOMARIACEA*, Kunze. Neighbourhood of the encampment.
160. *PTERIS INCISA*, Thunb. Base of the cliff.
156. *LOMARIA PLUMIERI*, Desv. Upper slopes of the mountain.
- 88, 167. *LOMARIA PROCERA*, Spreng. Upper slopes of the mountain and in the neighbourhood of the encampment.
48. *LOMARIA BORYANA*, Willd. Neighbourhood of the encampment.
- 157, 369. *ASPLENIUM LUNULATUM*, Sw., var. (*A. ERECTUM*, Bory). Base of the cliff.
171. *ASPLENIUM RHIZOPHORUM*, L., var. (*A. FLABELLATUM*, Kunze). Upper slopes of the mountain.
143. *ASPLENIUM FURCATUM*, Thunb. Neighbourhood of the encampment.
272. *ASPIDIUM CAPENSE*, Willd. Path to the upper savannah.
- 275 (4*). *NEPHRODIUM* (§ *LASTREA*) *BRACHYPODUM*, n. sp.; caudice erecto, stipitibus brevissimis cæspitosis pilosis, frondibus parvis lanceolatis firmulis subglabris simpliciter pinnatis e medio ad basin et apicem sensim attenuatis, rhachide piloso paleis paucis patulis lanceolatis prædito, pinnis sessilibus lanceolatis basi utrinque auriculatis centralibus profunde serratis reliquis integris infimis deltoideis, venis superioribus pinnarum simplicibus erecto-patentibus, inferioribus furcatis vel parce pinnatis, soris superficialibus medialibus, involucre membranaceo subpersistente.
- Fronde 5–6 in. long, an inch broad, narrowed very gradually from the middle to both ends. Lower pinnæ not more than $\frac{1}{8}$ in. long. Stipes not above half an inch long. Central pinnæ $\frac{1}{8}$ in. broad above the dilated base.
- Upper slopes of the mountain.
- May be an involucre form of the well-known West-Indian *Polypodium hastæfolium*, Sw., which it resembles very closely in size, shape, texture, and venation.
- 94, 380. *NEPHRODIUM CONTERMINUM*, Desv. Upper slopes of the mountain and neighbourhood of the encampment.
269. *NEPHRODIUM LEPRIEURII*, Hook. Neighbourhood of the encampment.
- 126, 169, 225. *NEPHRODIUM DENTICULATUM*, Hook. Upper slopes of the mountain and neighbourhood of the encampment.
354. *NEPHRODIUM AMPLISSIMUM*, Hook. Upper slopes of the mountain.
- 102, 339. *NEPHROLEPIS CORDIFOLIA*, Presl. Neighbourhood of the encampment.
- 356 (13*). *POLYPODIUM* (§ *PHEGOPTERIS*) *DEMERARANUM*, n. sp.; caudice erecto, stipite producto pubescente basi paleis paucis lanceolatis brunneis membranaceis prædito, frondibus oblongo-lanceolatis bipinnatifidis præsertim ad venas pilosis, pinnis sessilibus lanceolatis ad costam alatum pinnatifidis inferioribus reductis infimis remotis perparvis, pinnulis oblongo-lanceolatis integris obtusis, venulis simplicibus 8–9-jugis pilosis, soris superficialibus parvis supramedialibus.

Stipes 6-8 in. long below the much-dwarfed lowest pair of pinnæ, grey and pubescent, as is the rhachis. Largest basal paleæ half an inch long. Lamina $1\frac{1}{2}$ -2 ft. long, 7-8 in. broad at the middle. Largest pinnæ 4-4 $\frac{1}{2}$ in. long, about an inch broad. Pinnules above $\frac{1}{8}$ in. broad.

Closely allied to the Himalayan *P. auriculatum*, Wall., in size, texture, and cutting, but quite different in the position of the sori. Found on the upper slopes of the mountain. Gathered previously by Appun, 1138.

168 (15*). *POLYPODIUM* (§ *PHEGOPTERIS*) *RORAIMENSE*, n. sp.; caudice erecto, stipite producto glabro stramineo, frondibus oblongo-lanceolatis bipinnatis præter costas faciei superioris glabris, pinnis sessilibus lanceolatis simpliciter pinnatis inferioribus reductis infimis remotis perparvis, pinnulis oblongo-lanceolatis subintegris obtusis, venulis 7-8-jugis ascendentibus simplicibus, soris globosis superficialibus supra-medialibus.

Stipes 3-4 in. long below the dwarfed lowest pinnæ. Lamina $1\frac{1}{2}$ ft. long, 8-9 in. broad at the middle. Largest pinnæ 4-4 $\frac{1}{2}$ in. long, about an inch broad. Pinnules $\frac{1}{8}$ in. broad.

Closely allied to the preceding and to the West-Indian *P. Germanianum* and *ctenoides*. Gathered upon the upper slopes of the mountain.

177, 182, 282, 307, 345, 352, 376. *POLYPODIUM MARGINELLUM*, Sw. Upper slopes of the mountain, in the crevices of rocks.

184 (ex parte). *POLYPODIUM TRIFURCATUM*, L. Upper slopes of the mountain, mixed with *Enterosora Campbellii*.

166, 350, 368, 377. *POLYPODIUM FURCATUM*, Mett. Summit and upper slopes of the mountain.

133. *POLYPODIUM SERRULATUM*, Mett. The type in the neighbourhood of the encampment, and no. 351, var. (*Xiphopteris Jamesoni*, Hook.), on the upper slopes of the mountain.

178. *POLYPODIUM TRICHOMANOIDES*, Sw. Upper slopes of the mountain.

348. *POLYPODIUM TRUNCICOLA*, Klotzsch. Upper slopes of the mountain. New to Guiana.

181. *POLYPODIUM MONILIFORME*, Lag., var. (*P. SAXICOLUM*, Baker). Upper slopes of the mountain.

179. *POLYPODIUM TOVARENSE*, Klotzsch. Upper slopes of the mountain.

186 (159*). *POLYPODIUM* (§ *EUPOLYPODIUM*) *KALBREYERI*, n. sp.; rhizomate breviter repente paleis parvis patulis linearibus brunneis vestito, stipitibus contiguis elongatis erectis atro-brunneis, frondibus deltoideis simpliciter pinnatis coriaceis glabris, rhachide nudo castaneo, pinnis linearibus adnatis contiguis integris superioribus sensim minoribus, venis immersis occultis furcatis, soris globosis superficialibus latitudinem totam pinnarum inter costam et marginem occupantibus.

Stipes 8-10 in. long, naked or furnished towards the base with minute, squarrose, soft, hair-like paleæ. Rhachis castaneous, like the stipe. Lamina 5-6 in. long, 3-3 $\frac{1}{2}$ in. broad

2 x 2

at the base. Pinnæ about 20 on a side below the caudate apex of the frond, $\frac{1}{8}$ in. broad at the base, narrowed gradually to an acute point. Sori a line in diameter, 12–16-jugate on the lower pinnæ.

Nearest the Andine *P. melanopus*, Hook. & Grev., from which it differs by its stiffly erect stipes, frond broadest at the base, and obscure immersed veins. Found on the upper slopes of the mountain, and gathered previously by Kalbreyer on the mountains of the province of Ocana, in New Granada, at an elevation of 6500 ft.

186* (159*). *POLYPODIUM KOOKENAMÆ*, Jenman MSS., n. sp.; rhizomate valido breviter repente vel suberecto paleis subulatis castaneis ciliatis dense vestito, stipitibus castaneis elongatis parce ciliatis, frondibus oblongo-lanceolatis subcoriaceis glabris simpliciter subpinnatis, rhachide primario anguste alato, pinnis lanceolatis acutis integris basi confluentibus, costis immersis, venis furcatis, soris medialibus obscure immersis.

Stipes 6–9 in. long. Lamina 6–8 in. long, 2 in. broad, truncate at the base, dark green above, pale beneath. Pinnæ 16–20 on a side below the subentire acuminate apex of the frond, the largest an inch long, $\frac{1}{8}$ – $\frac{1}{4}$ in. broad. Primary rhachis purpuraceous on both sides of the frond. Sori terminal on the anterior fork of each vein.

This I have not seen, and insert entirely on Mr. Jenman's authority. I have merely altered the form of the description which he has sent, so as to make it uniform with the others. It did duty for no. 186 in set C of the distribution. Mr. Jenman says it is intermediate between *P. Kalbreyeri* and the Jamaican *P. brunneo-viride*.

180, 379. *POLYPODIUM TAXIFOLIUM*, Linn. Upper slopes of the mountain.

104. *POLYPODIUM PECTINATUM*, Linn. In the neighbourhood of the encampment.

124. *POLYPODIUM CULTRATUM*, Willd. In the neighbourhood of the encampment.

217. *POLYPODIUM XANTHOTRICHUM*, Klotzsch (*P. ellipticosorum*, Fée). Upper slopes of the mountain. Appears to be distinct specifically from *P. cultratum* by its uniformly elliptical sori.

281. *POLYPODIUM RIGESCENS*, Bory. Upper slopes of the mountain.

176. *POLYPODIUM FIRMUM*, Klotzsch. Upper slopes of the mountain.

378. *POLYPODIUM SUBSESSILE*, Baker. Upper slopes of the mountain.

190. *POLYPODIUM CAPILLARE*, Desv. Upper slopes of the mountain.

125 (212*). *POLYPODIUM* (§ *EUPOLYPODIUM*) *MELANOTRICHUM*, n. sp.; caudice erecto paleis subulatis crispatis vestito, stipite brevissimo gracillimo, frondibus oblongo-lanceolatis parvis flaccidis membranaceis glabris bipinnatifidis, pinnis lanceolatis adnatis profunde pectinato-pinnatifidis inferioribus sensim minoribus, segmentis deltoideis acutis, venis brevibus simplicibus erecto-patentibus, soris globosis superficialibus costularibus ad apicem venarum impositis.

Stipes and rhachis black, thread-like, glabrous. Lamina 3–4 in. long, an inch broad at the middle. Central pinnæ half an inch long, $\frac{1}{8}$ in. broad, with 6–8 pairs of deltoid segments with a single sorus in the centre of each.

Allied to the Brazilian *P. achilleæfolium*, Kaulf., but quite different in texture, in the shape of the segments, and by its very short simple veins. Found in the neighbourhood of the encampment.

172. POLYPODIUM (§ GONIOPHLEBIUM) LORICEUM, Linn. Base of the great cliff.
 340. POLYPODIUM (§ PHLEBODIUM) AUREUM, Linn., var. (P. AREOLATUM, H. B. K.). In the neighbourhood of the encampment.
 208. POLYPODIUM (§ CAMPYLONEURON) ANGUSTIFOLIUM, Sw., var. (P. AMPHOSTEMON, Kunze). In the neighbourhood of the encampment.

295 (14*). GYMNOGRAMME (§ PTEROZONIUM) CYCLOPHYLLA, n. sp. (Plate LIII. figs. 1, 2); caudice erecto, stipitibus cæspitosis elongatis erectis basi primum paleis minutis lineari-subulatis patulis præditis, frondibus parvis nitidis rigide coriaceis apice rotundatis margine recurvato basi cuneatis margine plano, venis flabellatis immersis, soris oblongis ad venarum apicem solum productis cite confluentibus zonam angustam intramarginalem formantibus.

Stipes wiry, 5–6 in. long. Lamina only about an inch long and broad. Found on the summit of the mountain.

101, 215 (14*). GYMNOGRAMME (§ PTEROZONIUM) ELAPHOGLOSSOIDES, n. sp. (Plate LIV. figs. 1–5); caudice valido lignoso paleis parvis subulatis nigro-castaneis dense vestito, stipitibus elongatis erectis nudis castaneis, frondibus simplicibus integris rigide coriaceis nudis elliptico-lanceolatis acutis vel obtusis conspicue costatis basi cordatis, venis confertis patulis parallelis simplicibus vel furcatis intra marginem evanescentibus, soris linearibus cite confluentibus frondis faciem totam inferiorem præter zonam angustam marginalem occupantibus.

Stipes wiry, sometimes above half a foot long. Fronds 6–8 in. long, fertile 1–2 inches, sterile sometimes 3 inches broad. Sori occupying the whole under surface except a marginal border. Not more than $\frac{1}{8}$ – $\frac{1}{4}$ in. broad. Found both upon the upper slopes of the mountain and in the neighbourhood of the encampment.

These two interesting novelties both fall under the genus *Pterozonium* of Fée, figured on tab. 16 of his 'Genera Filicum.' The only species known previously is the very rare *Gymnogramme reniformis*, Mart., figured Icon. Crypt. Bras. t. 26, and also in Hooker's 'Second Century of Ferns,' t. 9, and on tab. 49 of the Fern volume of 'Flora Brasiliensis.' The two new species are very distinct, both from one another and *G. reniformis*. In *G. cyclophylla* the sori form a narrow band just within the margin; in *G. reniformis* a broad semicircle, a distinct space within the margin, whilst in *G. elaphoglossoides* they cover the whole surface except a narrow border.

164. GYMNOGRAMME SCHOMBURGKIANA, Kunze. Upper slopes of the mountain.
 197. GYMNOGRAMME HIRTA, Desv. Upper slopes of the mountain. New to Guiana.
 159. GYMNOGRAMME FLEXUOSA, Desv. Upper slopes of the mountain. Also new to Guiana.

ENTEROSORA, nov. gen.

Sori oblongi vel oblongo-cylindrici exindusiati ad venas decurrentes, intra frondis laminam orti, demum ad frondis faciem inferiorem rimis angustis obliquis imperfecte obvii. Venæ pinnatæ, venulis paucis ascendentibus prope frondis marginem anastomosantibus et areolas steriles hexagonas soro unico centrali includentes formantibus.

Most resembles *Gymnogramme*, from which it differs mainly by having the sori immersed in the centre of the frond, and only appearing very partially on its lower surface even in a mature stage.

184 (ex parte). ENTEROSORA CAMPBELLII, Baker. (Plate LV. figs. 1-5.)

The only species: upper slopes of the mountain, with *Polypodium trifurcatum*. Root-stock cylindrical, suberect, densely clothed with small brown membranous lanceolate paleæ. Stipes slender, brown, erect, wiry, 4-5 in. long, with a few very inconspicuous spreading fibrillose paleæ downwards. Lamina oblanceolate, simple, subcoriaceous, glabrous, 6-8 in. long, under an inch broad, obtuse, narrowed gradually to the base, conspicuously repand on the margin, with broad rounded lobes. Veins very distinct when the frond is held up to the light, arranged in pinnate groups, one opposite each lobe, the sterile veinlets forming unequal hexagonal areolæ, with a single vein bearing a sorus in the centre of each. Sori $\frac{1}{8}$ - $\frac{1}{4}$ in. long, 4-6 to each of the central pinnated groups, erectopatent as regards the whole lamina, seen partially at last on the lower surface by slits that seem as if they were made with a knife through the epidermis.

Frond in shape and texture much resembling that of *Polypodium trifurcatum*, from which it differs by its long stipes and totally different veining, in addition to the entirely dissimilar shape and position of its sori. In naming it after the late W. H. Campbell, Esq., I am carrying out the wish of Mr. im Thurn.

170. VITTARIA LINEATA, Sw. Upper slopes of the mountain.

212, 218. VITTARIA STIPULATA, Kunze. Upper slopes of the mountain. New to Guiana.

229, 231. ACROSTICHUM LATIFOLIUM, Sw. Upper slopes of the mountains. Two different varieties, both rigid in texture, narrowed very gradually from the middle to the base, and 229 dotted over the under surface with minute subpeltate brown paleæ.

233, 238. ACROSTICHUM LINGUA, Raddi.

267. ACROSTICHUM STENOPTERIS, Klotzsch. In the neighbourhood of the encampment. New to Guiana.

266. ACROSTICHUM DECORATUM, Kunze. In the neighbourhood of the encampment.

278. ACROSTICHUM AUBERTII, Desv., var. CRINITUM, nov. var. Recedes from the Brazilian and Colombian type of the species towards *A. villosum* by its much more crinite lamina both in the sterile and fertile frond, and by the stipes being densely clothed with squarrose subulate brown paleæ, as in the Venezuelan *A. Reichenbachii*, Moritz. Path to the upper slope. The species is new to Guiana.

237 (45*). *ACROSTICHUM* (§ *ELAPHOGLOSSUM*) *LEPTOPHLEBIUM*, n. sp.; rhizomate repente cylindrico lignoso paleis parvis membranaceis lanceolatis brunneis crispatis dense vestito, stipite elongato stramineo subnudo, fronde sterili lanceolato membranaceo glabro paleis paucis lanceolatis ad marginem et faciem inferiorem prædito, venis laxis perspicuis erecto-patentibus simplicibus vel furcatis intra marginem terminantibus, fronde sterili multo minore, stipite longiore.

Sterile lamina a foot or more long, 18–20 lines broad, cuneate at the base, with a slender fragile stipe 4–5 inches long. Fertile lamina 4–5 inches long, an inch broad, with a stipe about a foot long. Found upon the upper slopes of the mountain.

93. *ACROSTICHUM MUSCOSUM*, Sw., var. *A. ENGELII*, Karst. In the neighbourhood of the encampment.

213. *ACROSTICHUM SQUAMOSUM*, Sw. Upper slopes of the mountain.

41. *ACROSTICHUM* (§ *RHIPIDOPTERIS*) *PELTATUM*, Sw. In the neighbourhood of the encampment.

100. *SCHIZÆA DICHOTOMA*, Sw. In the neighbourhood of the encampment. New to Guiana.

85. *SCHIZÆA ELEGANS*, Sw. In the neighbourhood of the encampment.

263. *ANEMIA TOMENTOSA*, Sw. In the neighbourhood of the encampment.

146. *LYCOPodium ALOPECUROIDES*, L. In the neighbourhood of the encampment.

192. *LYCOPodium LINIFOLIUM*, L., var. *SARMENTOSUM RUBESCENS*, Spring. Upper slopes of the mountain.

230. *LYCOPodium SUBULATUM*, Desv. Base of the cliff.

226 (159*). *SELAGINELLA* (§ *STACHYGYNANDRUM*) *VERNICOSSA*, n. sp. (Plate LVI. A. figs. 1–7); caule basi decumbente superne recto laxè pinnato, ramulis paucis brevibus ascendentibus, foliis heteromorphis distichis crassis firmis nitide viridibus, planæ inferioris confertis erecto-patentibus ovatis obtusis margine ubique denticulatis planæ superioris duplo brevioribus ascendentibus ovatis obtusis valde imbricatis, spicis tetragonis brevissimis, bracteis conformibus magnis ovatis acutis.

This belongs to the *Atrovirides* group in the neighbourhood of *S. Martensii*. The main stems are about half a foot long, the leafy branches an eighth of an inch broad, and the leaves of the lower plane a line long. The type (A. figs. 1–7) as described was found at the base of the cliff, and a variety (No. 381) (B. fig. 8, var. *oligoclada*), with much fewer more elongated branches, near the encampment.

122 (186*). *SELAGINELLA* (§ *STACHYGYNANDRUM*) *RORAIMENSIS*, n. sp. (Plate LVI. C. figs. 9–14); caule erecto 3–4-pinnato, ramis laxè dispositis ascendentibus ramulis brevibus, foliis heteromorphis distichis membranaceis, planæ inferioris laxis oblongo-lanceolatis acutis valde inæquilateralibus basi superiore producto late rotundato, planæ superioris ovatis ascendentibus cuspidatis, spicis tetragonis, bracteis conformibus ovatis acutis valde imbricatis acute carinatis sporangiis duplo longioribus.

Belongs to the *Radiata* group in the neighbourhood of *S. radiata* and *confusa*. The main stems are 4 or 5 inches long, the leafy branches $\frac{1}{4}$ in. broad, and the leaves of the lower plane a line long. Found in the neighbourhood of the encampment.

(271*.) SELAGINELLA (§ HETEROSTACHYS) RHODOSTACHYA, n. sp. ; caule decumbente, ramis alternis deltoideis flabellato-bipinnatis, foliis heteromorphis distichis membranaceis, planæ inferioris laxè dispositis erecto-patentibus ovatis obtusis paulo inæquilateralibus, planæ superioris consimilibus duplo minoribus valde ascendentibus, spicis brevissimis platystachyoideis, bracteis dimorphis ovatis acutis membranaceis.

Belongs to the group *Pronifloræ* in the neighbourhood of *S. consimilis* and *Otonis*. The stems are half a foot in length, and the leafy branches $\frac{1}{8}$ in. broad. This was contained in the collection without any number.

MUSCI. By Mr. W. MITTEN, A.L.S.

HOOKERIA (§ OMALIADELPHUS) CRISPA, C. Müll. Bot. Zeit. 1855, p. 768. Perfectly fruited, near encampment, no. 123.

HYPOTERYGIUM TAMARISCI, Brid. ; *Hypnum Tamarisci*, Sw. ; Hedw. Musc. Frond. t. 51. Without fruit. Near encampment, no. 265.

POLYTRICHUM ARISTIFLORUM, Mitt. Journ. Linn. Soc., Bot. vol. xii. p. 620. A few barren stems, near encampment, no. 116.

Creeping over the roots of this are a few stems of *Jungermannia perfoliata*, Swartz, or of one of the closely allied South-American species of the little group to which Mr. Spruce has applied the name *Syzygiella* in the 'Journal of Botany,' 1876, intending it to include *Jungermannia perfoliata*, *J. contigua*, and *J. concreta*, Gottsche, *J. plagiochiloides* and *J. pectiniformis*, Spruce, also *J. macrocalyx*, Mont. ; to these must be added *J. geminifolia*, Mitt., Journ. Linn. Soc., Bot. vol. vii. p. 164, from tropical Africa, and the *J. subintegerrima*, Reinw. Bl. et Nees, Hep. Jav. in the 'Synopsis Hepaticorum,' placed in *Plagiochila* (p. 55). To this species belong *P. variegata*, Lindenb., *P. variabilis*, Lacoste, and also *P. securifolia*, Lindenb. Sp. Hep. t. x., all of which have the leaf-angles united on both sides of the stem, even when they are not opposite, a characteristic which is not mentioned in their original descriptions, or depicted in their figures, nor in that of the *J. macrocalyx* as found in the 'Synopsis.' The perianth in *J. subintegerrima* agrees with that found in the species allied to *J. colorata*, and, as in their case, is subtended by shortened and dentate involucreal leaves. Exactly similar instances of conjugation of the leaf-angles are found in *Plagiochila*, some of which do not otherwise resemble each other.

PLAGIOCHILA ADIANTOIDES, Lindenb. Male stems only, upper slope, no. 283.

ANEURA BIPINNATA, Nees (*Jungermannia*, Sw.). Specimens taken from large tufts, upper slopes, nos. 204, 284.

In these specimens the stems are 4-5 cm. high, including the side branches 1 cm. wide, the ultimate ramuli with a limb of about two rows of more pellucid cells ; in *A. fucoides*, Hook. Musc. Exot. t. 85, this limb is very much wider ; in *A. Poeppigiana* it is nearly or

quite obsolete. Besides these there are several other remarkable South-American species : *A. alata*, Gottsche, from Chili, a very large species ; *A. prehensilis*, Hook. f. et Tayl. Fl. Ant. t. 160. fig. 9 (under *Jungermannia*), originally from Hermite Island, since collected by Cunningham, with stems nearly six inches high, and always with its pruinose look when dry ; *A. polyclada*, Mitt., gathered in Otway Harbour, Patagonia, during the visit of the 'Challenger' Expedition, a small species about an inch and a half high (frons dorso planus lævis, ramis valde approximatis bipinnatis, ventre ramulis curvulis crispulis telam spongiosam formantibus, margine ubique limbo e cellularum 3-4 lato pellucidior distincto) ; *A. polyptera*, Mitt., from Magellan, collected in Cockle Cove by Dr. Coppinger, H.M.S. 'Alert' (frons 10 cm. alt., 2 cm. lat., ramis approximatis tripinnatis ubique lamina 5-6 cell. lata, limbatus dorso planus lævis ventre præcipue in ramis ramulisque lamellis angustis longitudinalibus vestitus) ; and *A. denticulata*, Mitt., from the Andes of Bogota, gathered amongst mosses by Weir (frons 5-6 cm. altus cum ramulis 1 cm. latus, ramis remotiusculis bipinnatis ubique limbo pellucidior cell. 4 lato margine denticulis divaricatis angustis subciliatus). All these species show that in South America there is a development of larger forms than are yet known elsewhere.

BLEPHAROZIA RORAIMÆ. Folia erecto-patentia imbricata, cochleariformi-concava integerrima e lobulato obtusa ; involucralia conformia, perianthia (abortiva) cylindracea abrupta obtusissima, ore parvo rotundo.

From the top of Roraima, one stem only.

Entire plant of a dark red-brown colour, about 4 cm. high ; it is divided below into two, one branch being again forked, the leaves are imbricated in bifarious order and are repeatedly in interrupted series ; each innovation arises from towards one side of the dorsal base of the perianth with small leaves, which increase rapidly in size upwards, the largest being the involucral, here the greatest diameter is about 4 mm. : the perianths are also about 4 mm. long, and of these as many as four are observable on the undivided stem, and as each innovation arises from the same position, they stand at the side of the stem rather towards the ventral side ; in all particulars they closely resemble the abortive perianths seen on *B. sphagnoides* and other species ; the young innovation also closely agrees with that of the male amenta of that species ; but there is no trace of the lobule, which is not, as has been supposed, distinct from the leaf in *B. cochleariformis*, but is seen, from being an almost closed sac in some species, to be opened out in *B. evoluta*.

DESCRIPTION OF THE PLATES.

PLATE XXXVII.

Figs. 1-8. (A.) *Leitgebia Imthurniana*, Oliver, sp. n. 1, plant in flower ; 2, leaf ; 3, pedicel and calyx ; 4, bract ; 5, corona ; 6, two stamens and segment of corona ; 7, pistil ; 8, transverse section of ovary.

Figs. 9-17. (B.) *Bonnetia Roraimæ*, Oliver, sp. n. 9, plant in flower ; 10, leaf ; 11, flower ; 12, calyx ; 13, petal ; 14, phalange of stamens ; 15, a back and front view of stamen ; 16, pistil ; 17, transverse section of ovary.

Figs. 1 and 9 reduced sketches, fig. 8 nat. size ; all the other figures enlarged.

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PLATE XXXVIII.

Figs. 1-6. (A.) *Ravenia ruellioides*, Oliver, sp. n. 1, portion of plant in flower; 2, calyx and pistil; 3, corolla, laid open; 4, anther, back and front; 5, pistil; 6, vertical section of ovary and disk. All enlarged.

Figs. 7-13. (B.) *Myrcia* (§ *Aulomyrcia*) *Roraimæ*, Oliver, sp. n. 7, plant; 8, bud; 9, expanded flower; 10, calyx, the petals and stamens removed; 11, stamen, back and front; 12, longitudinal section of ovary and calyx-tube; 13, transverse section of ovary.

PLATE XXXIX.

Figs. 1-9. (A.) *Myrtus stenophylla*, Oliver, sp. n. 1, plant in flower and fruit; 2 & 3, leaf, above and below; 4, expanded flower; 5, calyx and bracteoles; 6, stamen, front and back view; 7, transverse section of ovary; 8, fruit; 9, seed. All enlarged.

Figs. 10-18. (B.) *Microlicia bryanthoides*, Oliver, sp. n. 10, plant in flower and fruit; 11, leaves; 12, bud; 13, expanded flower; 14, longer, 15, shorter stamens; 16, apex of ovary and style; 17, fruit; 18, seed. All enlarged.

PLATE XL.

Figs. 1-6. *Crepinella gracilis*, March., sp. n. 1, plant in flower; 2, bud; 3, expanded flower; 4, stamen, front and back view; 5, calyx-tube and ovary; 6, longitudinal section of ovary. All enlarged.

PLATE XLI.

Figs. 1-8. *Sciadophyllum coriaceum*, March., sp. n. 1, plant in flower; 2, bud; 3, coherent petals; 4, petal apart; 5, anther, back and front; 6, ovary; 7, transverse section of ovary; 8, young fruit. All enlarged.

PLATE XLII.

Figs. 1-7. (A.) *Psychotria Imthurniana*, Oliver, sp. n. 1, plant in flower; 2, stipules; 3, expanded flower; 4, corolla, laid open; 5, stamen, back and front; 6, ovary and style; 7, longitudinal section of ovary.

Figs. 8-15. (B.) *Psychotria concinna*, Oliver, sp. n. 8, plant in flower; 9, stipules; 10, flower; 11, corolla, laid open; 12, anther, back and front; 13, ovary and style; 14, epigynous disk; 15, longitudinal section of ovary. All enlarged.

PLATE XLIII.

Figs. 1-8. (A.) *Baccharis Vitis-Idæa*, Oliver, sp. n. 1, male plant, and 2, female plant; 3, male capitulum; 4, floret; 5, seta of pappus; 6, stamens; 7, style; 8, female floret. All enlarged.

Figs. 9-16. (B.) *Calea ternifolia*, Oliver, sp. n. 9, plant in flower; 10 & 11, scales of involucre; 12, palea of receptacle; 13, floret; 14, seta of pappus; 15, anthers; 16, style. All enlarged.

PLATE XLIV.

Figs. 1-6. (A.) *Ledothamnus guyanensis*, Meissn. 1, plant in flower; 2 & 3, leaves; 4, sepal; 5, stamens, front and back view; 6, pistil. All enlarged.

Figs. 7-11. (B.) *Utricularia* (§ *Orchidioides*) *Campbelliana*, Oliver, sp. n. 7, different views of plant in flower; 8, ampullæ; 9, calyx-lobe; 10, lower lip of corolla and spur?; 11, stamens. All enlarged.

PLATE XLV.

Figs. 1 & 2. *Tabebuia Roraimæ*, Oliver, sp. n. 1, plant in flower; 2, stamens. All enlarged.

PLATE XLVI.

Figs. 1-6. (A.) *Epidendrum Imthurnii*, Ridley, sp. n. 1, plant in flower; 2, flower; 3, labellum and column, front view; 4, ditto, side view; 5, anther-case; 6, pollinia. All enlarged.

Figs. 7-10. (B.) *Epidendrum violascens*, Ridley, sp. n. 7, plant in flower; 8, expanded flower; 9, same, posterior sepal and lateral petal attached; 10, fruiting specimen. Figs. 7 and 10 about nat. size, 8 and 9 are enlarged.

PLATE XLVII.

Figs. 1-6. *Zygopetalum venustum*, Ridley, sp. n. 1, plant in flower; 2, labellum and column; 3, labellum, side view; 4, column; 5, anther-case; 6, pollinium. All enlarged.

PLATE XLVIII.

Figs. 1-6. (A.) *Stenoptera adnata*, Ridley, sp. n. 1, plant in flower; 2, flower; 3, labellum; 4, column; 5, same, side view; 6, pollen. All enlarged.

Figs. 7-11. (B.) *Pelexia aphylla*, Ridley, sp. n. 7, plant in flower; 8, expanded flower; 9, longitudinal section of perianth-tube, with labellum; 10, column; 11, pollen. All enlarged.

PLATE XLIX.

Figs. 1-6. (A.) *Tofieldia Schomburgkiana*, Oliver, sp. n. 1, plant in flower; 2, fragment of leaf, showing ciliolate margin; 3, flower; 4, stamen; 5, pistil; 6, transverse section of ovary. All enlarged.

Figs. 7-14. (B.) *Papalanthus Roraimæ*, Oliver, sp. n. 7, plant; 8, outer smaller, and inner larger involucre bracts; 9, staminate flower and bracteole; 10, same, expanded; 11, inner perianth-segment and adnate stamen; 12, stamen, back and front view; 13, pistillate flower; 14, pistil. All enlarged.

PLATE L.

Figs. 1-8. (A.) *Xyris setigera*, Oliver, sp. n. 1, plant in flower; 2, fragment of leaf, showing setose margin; 3, involucre bract; 4, flower; 5, perianth, laid open; 6, stamen; 7, penicillate staminodia; 8, style-branches. All enlarged.

Figs. 9-15. (B.) *Xyris witsenioides*, Oliver, sp. n. 9, plant in flower; 10 & 11, involucre scales; 12, perianth, laid open; 13, 13 a, anthers, back and front; 14, staminode; 15, pistil. All enlarged.

PLATE LI.

Figs. 1-6. *Cryptangium stellatum*, Bœckl. 1, plant; 2, branchlet of inflorescence; 3, spikelet; 4 & 5, outer and inner glumes; 6, anther. All enlarged.

PLATE LII.

Figs. 1-8. *Everardia montana*, Ridley, sp. n. 1, plant; 2, branchlet of inflorescence; 3, male spikelet; 4, florets; 5, glume; 6, stamens; 7, female spikelet; 8, pistil and hypogynous setæ. Fig. 1 about nat size, all others enlarged.

PLATE LIII.

Figs. 1, 2. *Gymnogramme* (§ *Pterozonium*) *cyclophylla*, Baker, sp. n. 1, plant; 2, portion of frond, enlarged.

PLATE LIV.

Figs. 1-5. *Gymnogramme* (§ *Pterozonium*) *elaphoglossoides*, Baker, sp. n. 1, upper, 2, lower surface of frond; 3, palea; 4, portion of frond, showing venation and position of sori; 5, rootstock. Figs. 3 and 4 enlarged.

PLATE LV.

Figs. 1-5. *Enterosora Campbellii*, Baker, gen. nov. 1, plant; 2, palea; 3, portion of frond, showing venation and sori; 4, horizontal section of a frond; 5, portion of same, much enlarged.

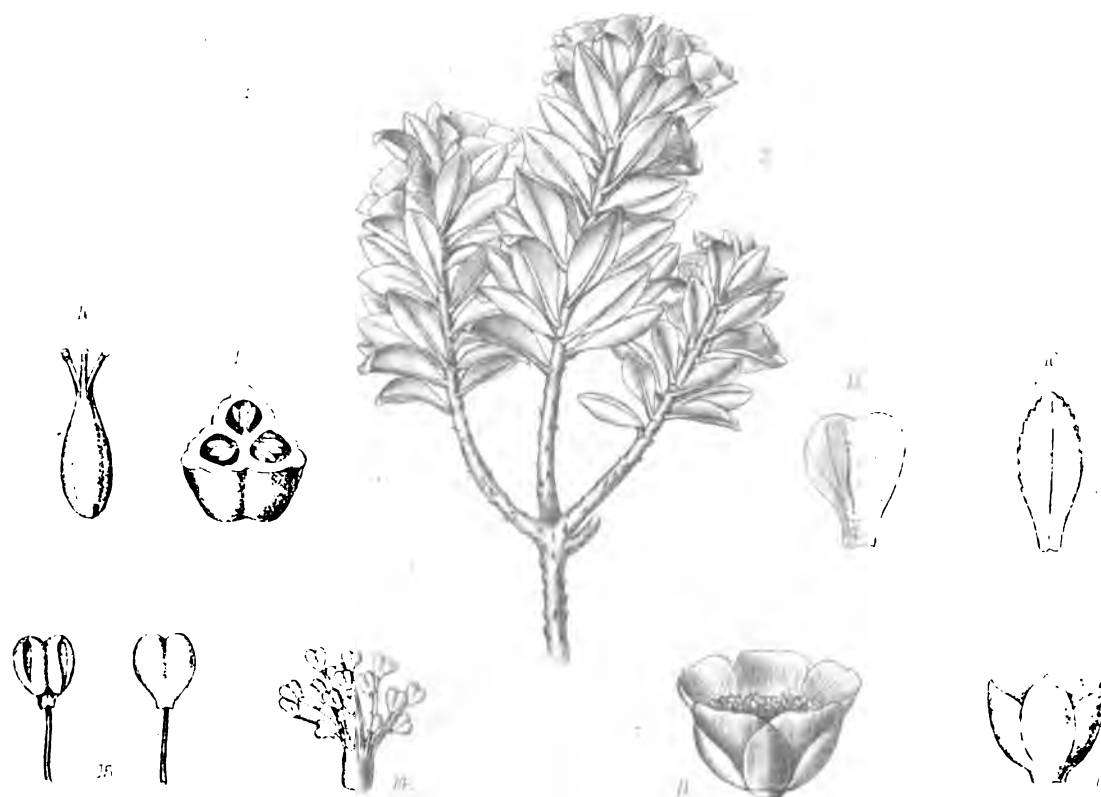
PLATE LVI.

Figs. 1-7. (A.) *Selaginella* (§ *Stachygynandrum*) *vernica*, Baker, sp. n. 1, plant; 2, fertile branch; 3, front view of portion of stem, and 4, back view of same; 5, stipule (or smaller leaf); 6, bract; 7, capsule.

Fig. 8. (B.) *Selaginella* (§ *Stachygynandrum*) *vernica*, var. *oligoclada*.

Figs. 9-14. (C.) *Selaginella* (§ *Stachygynandrum*) *roraimensis*, Baker, sp. n. 9, plant; 10, fertile branch; 11, back of stem; 12, leaf; 13, stipule; 14, bract with capsule.

Figs. 1, 8, and 9 of natural size, all the others enlarged.

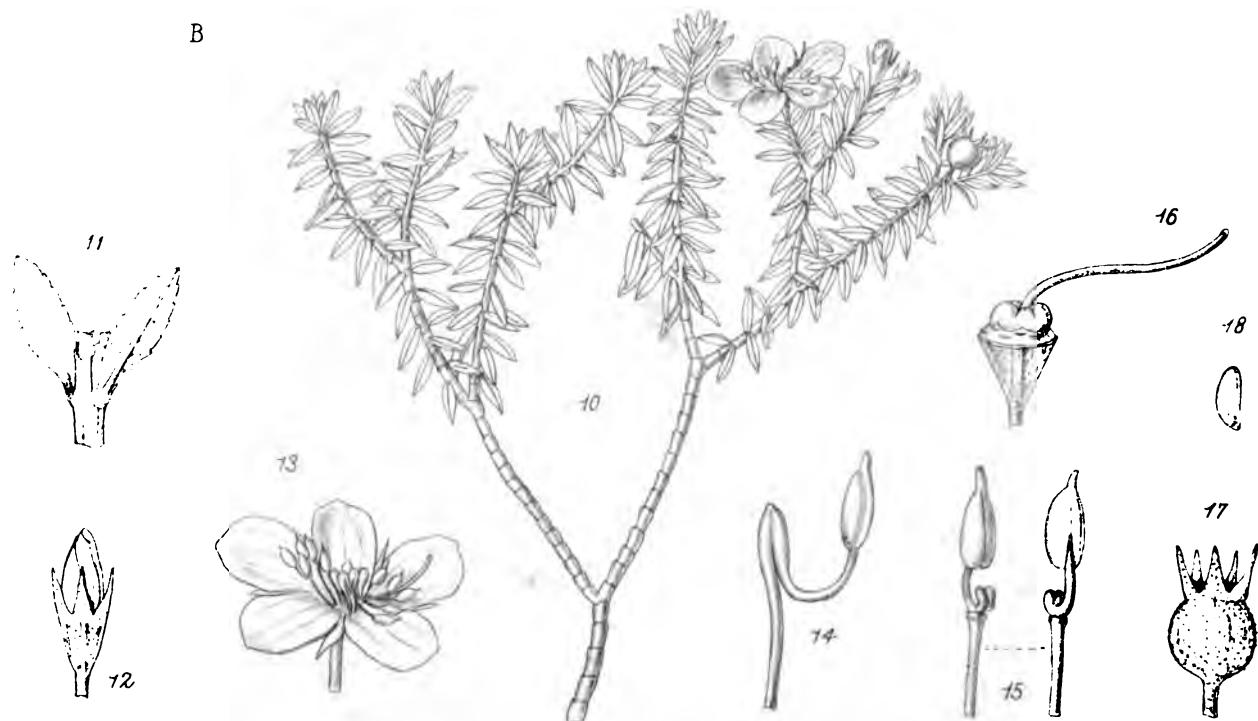




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A 1-6 *RAVENIA RUELLIOIDES*, *Oliver*.
B 7-13 *MYRCIA RORAIMÆ*, *Oliver*

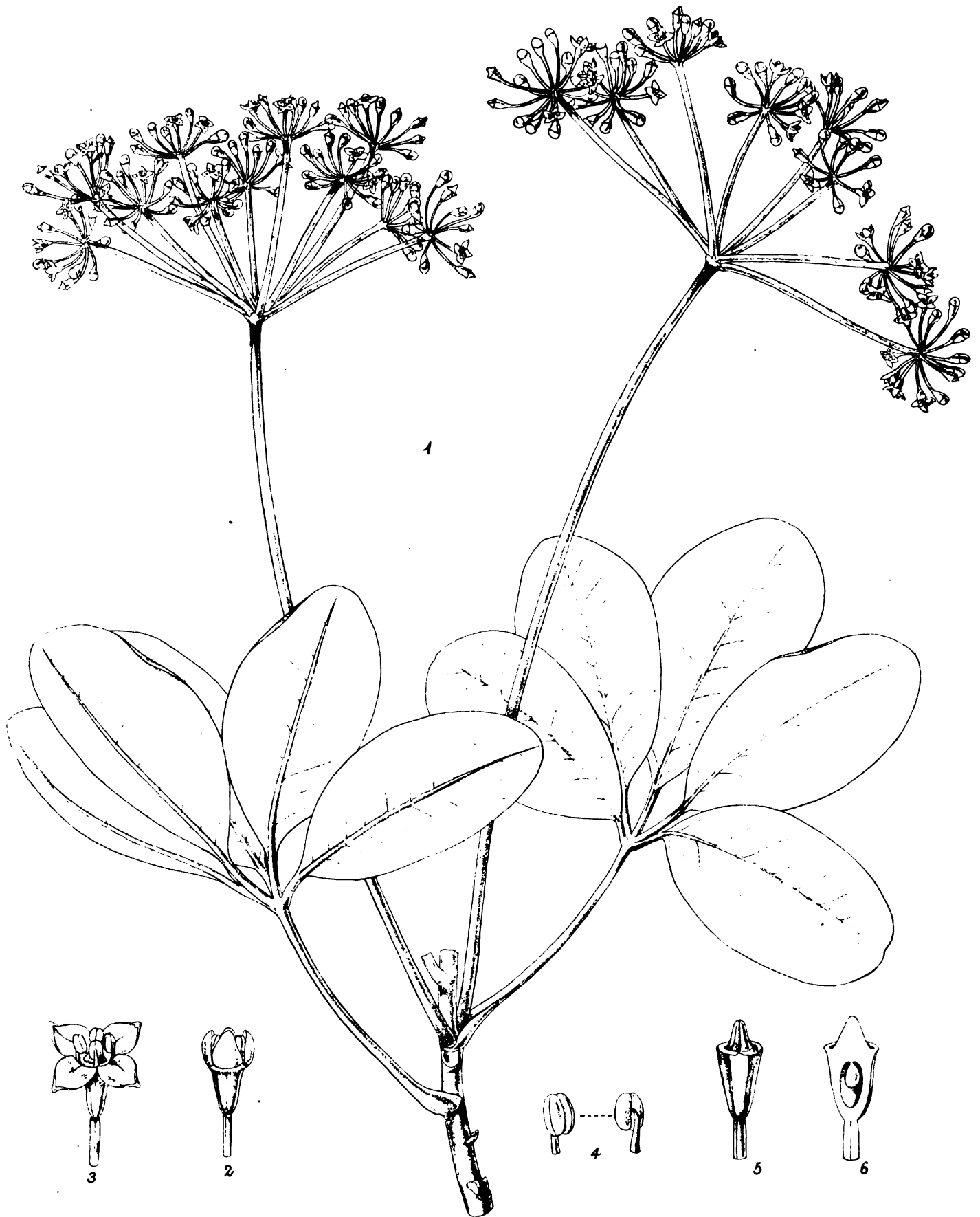
J. N. Fitch sculp.



M. Smith del. Morgan lith.

A. 1-9 MYRTUS STENOPHYLLA, *Oliver*
B. 10-18 MICROLICIA BRYANTHOIDES, *Oliver*

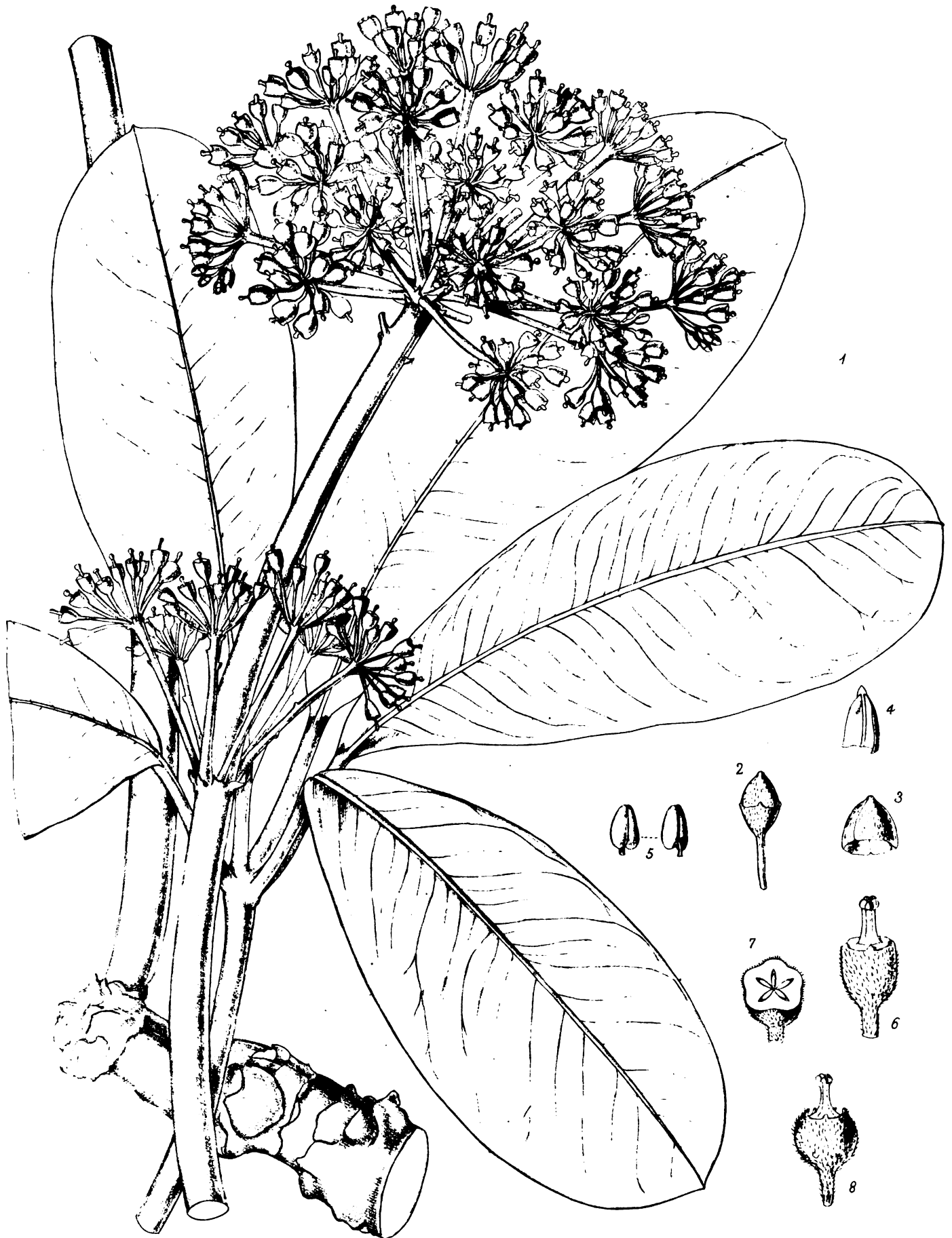
J.N. Fitch imp.

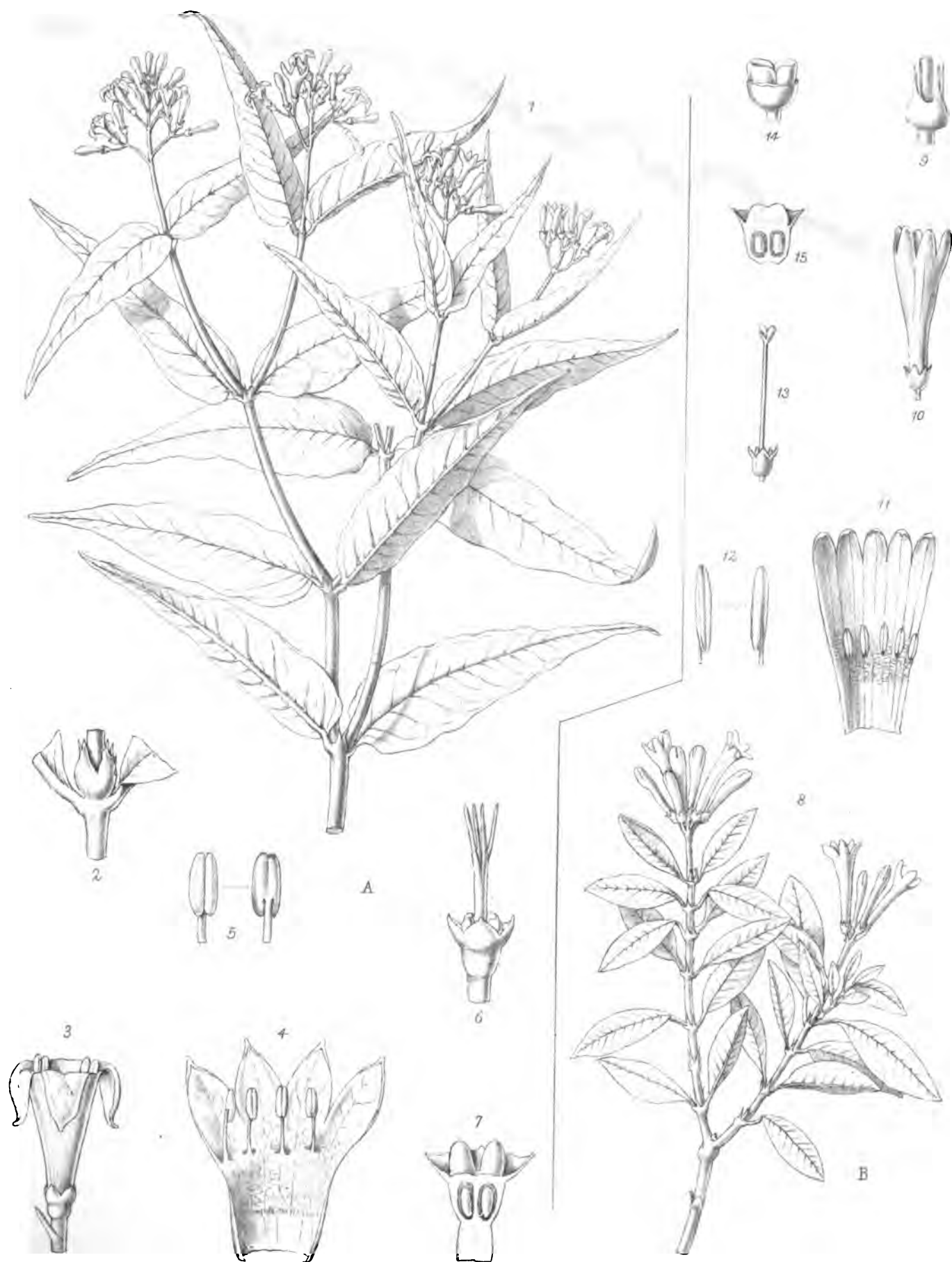


M. Smith del. C. H. Fitch lith.

CREPINELLA GRACILIS, March.

J. N. Fitch imp.





V. Smith del.
Van der Schueren lith.

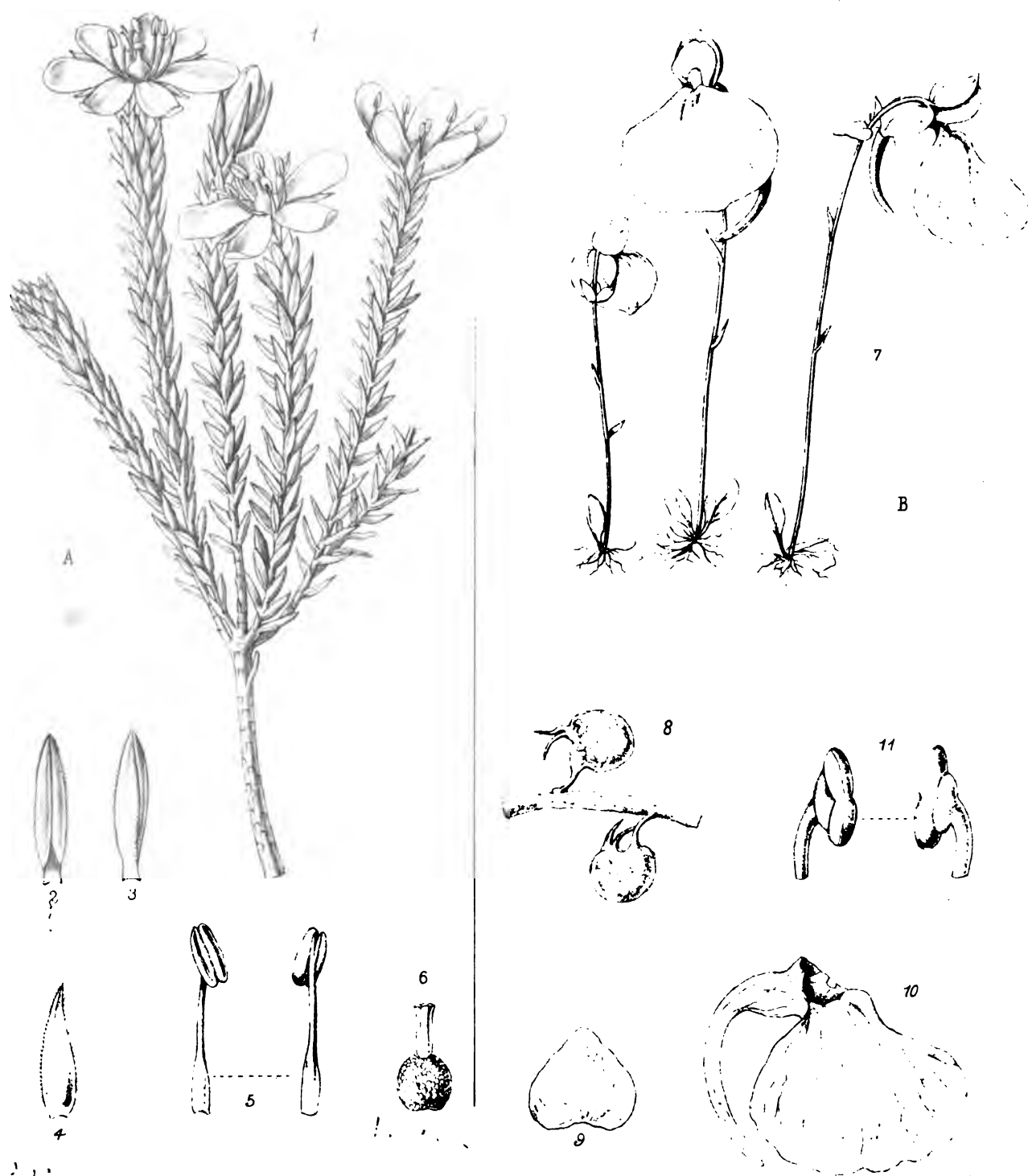
A 1-7 *PSYCHOTRIA IMTHURNIANA*, Oliv. B 8-15 *P. CONCINNA*, Oliv.

J. N. Fitch. map.
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M. Smith del.
J. Allen lith.

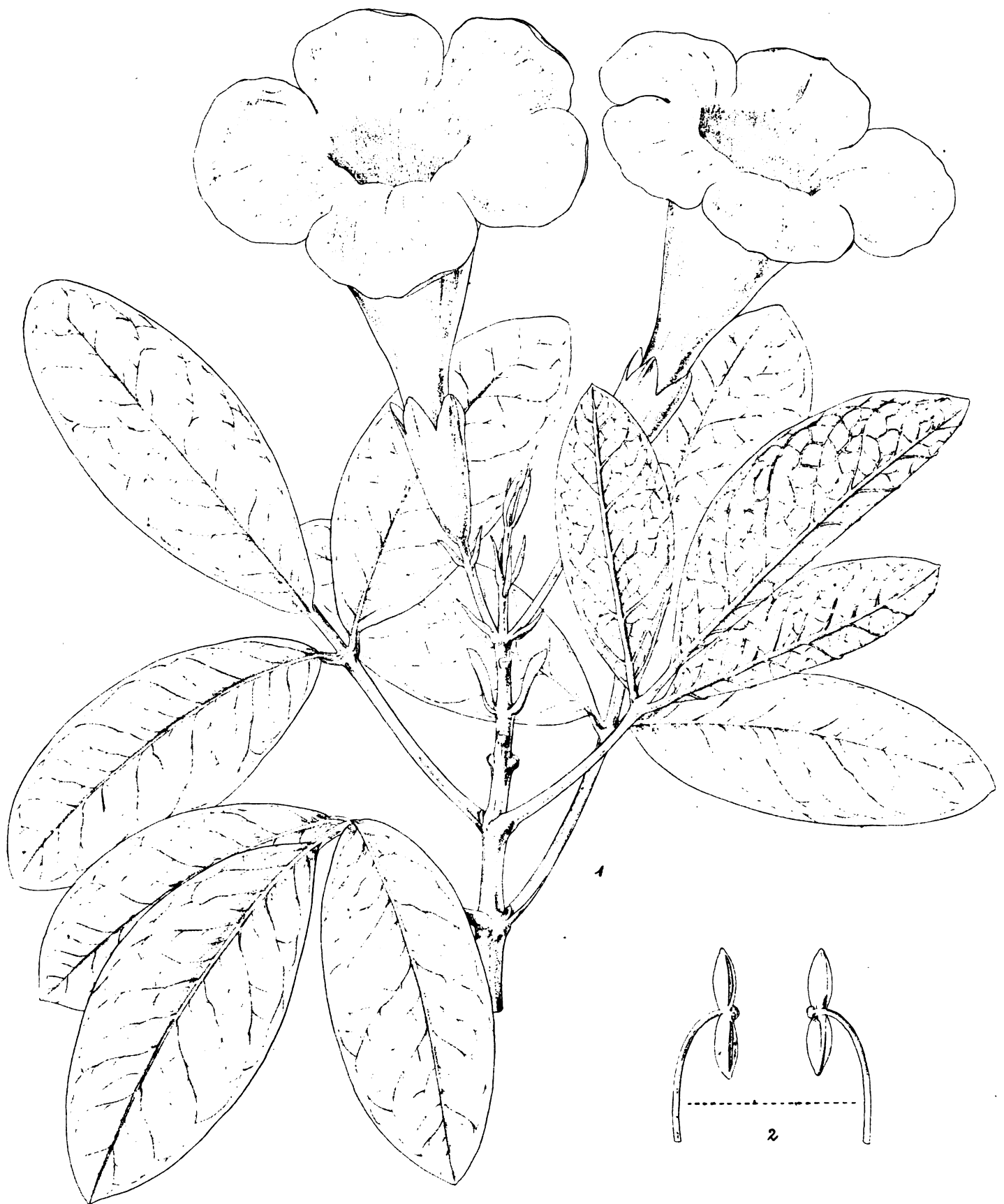
A 1-8 *BACCHARIS VITIS-IDEA*, Oliv. B 9-16 *CALEA TERNIFOLIA*, Oliv.



M. Smith del.
Van Kerssen lith.

A. 1-6 LEDOTHAMNUS GUYANENSIS. Meissn
B. 7-11 UTRICULARIA CAMPBELLIANUM Oliv

J. N. Fitch, imp.

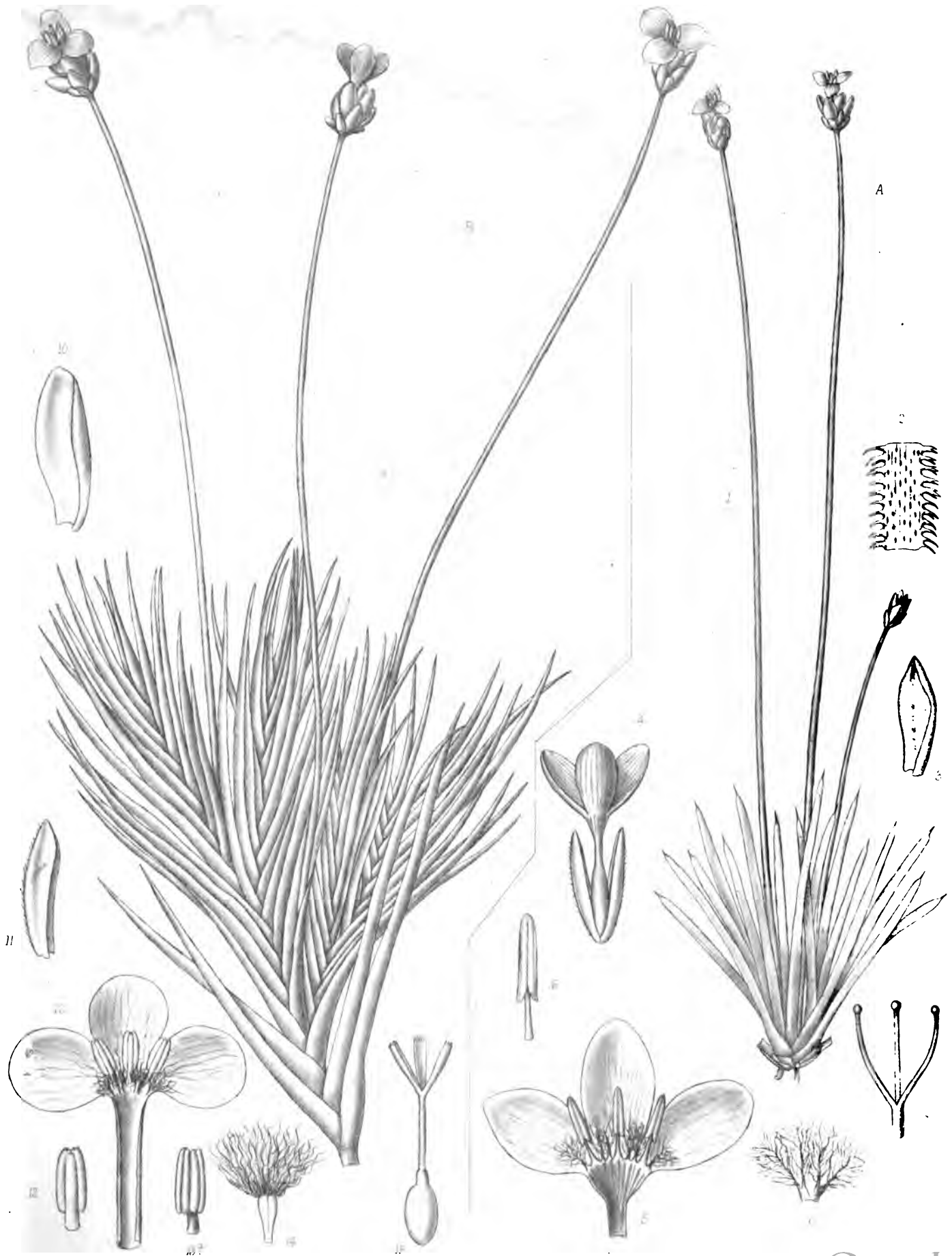




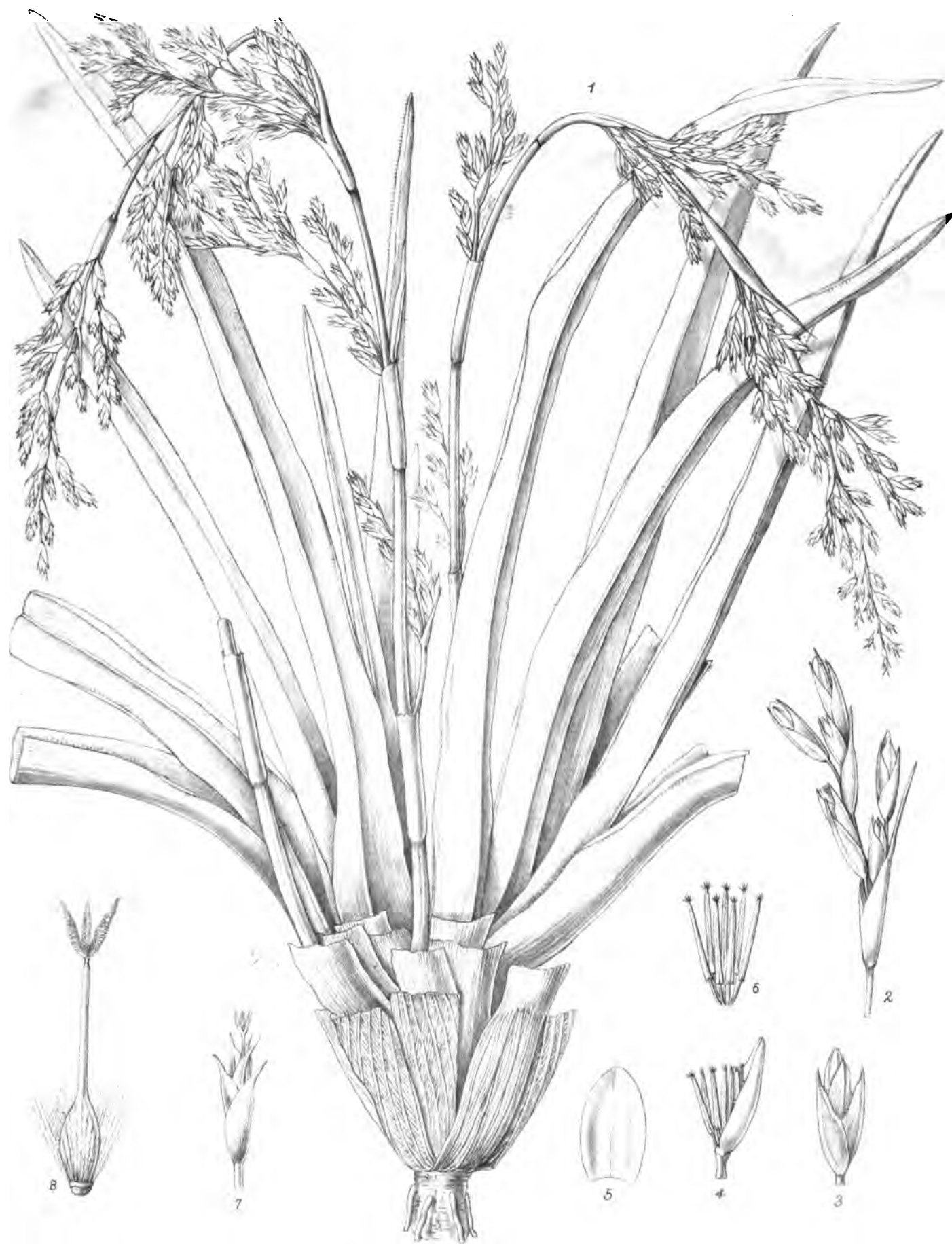






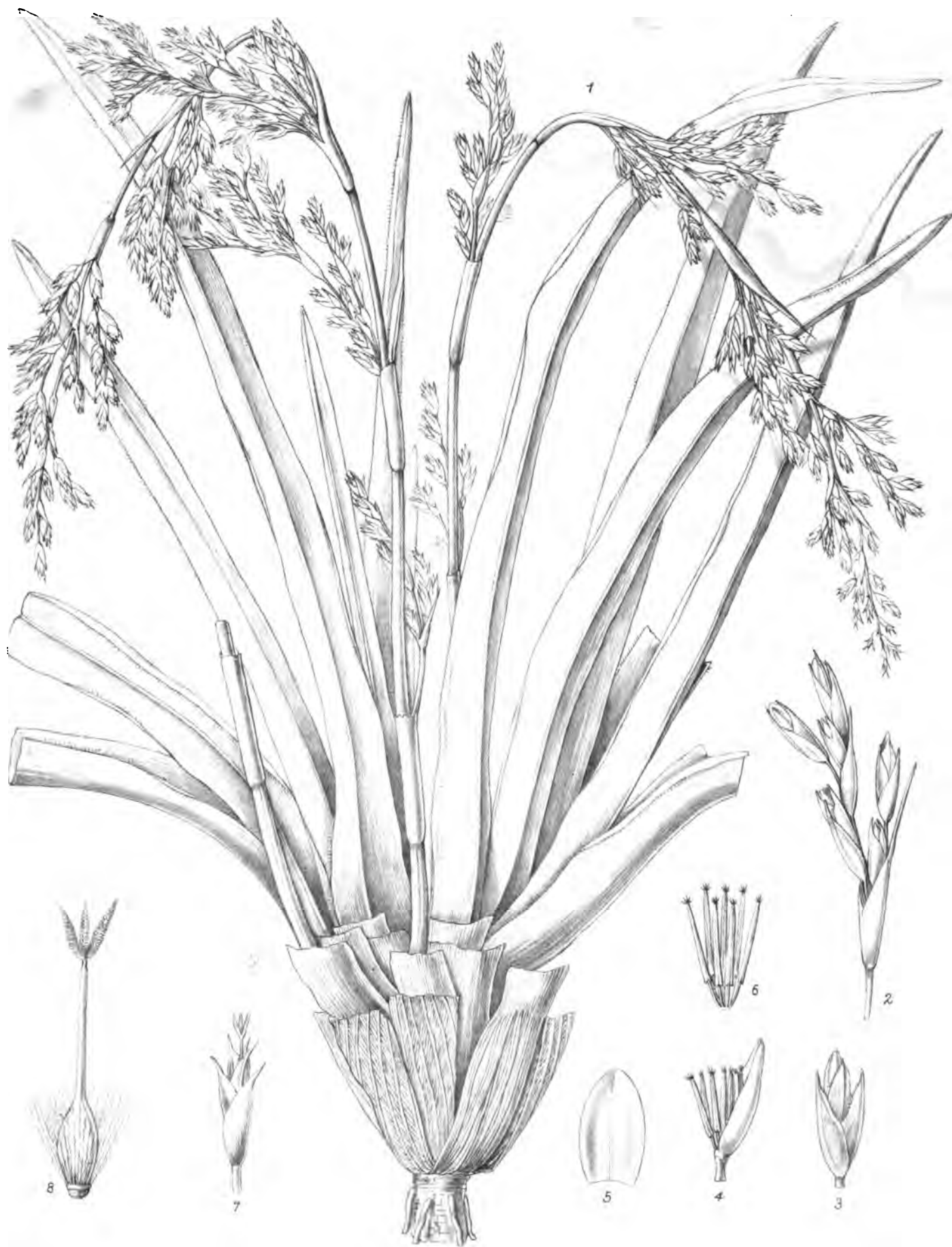












M. Smith del. Van derzon lith.

EVERARDIA MONTANA, Ridley.

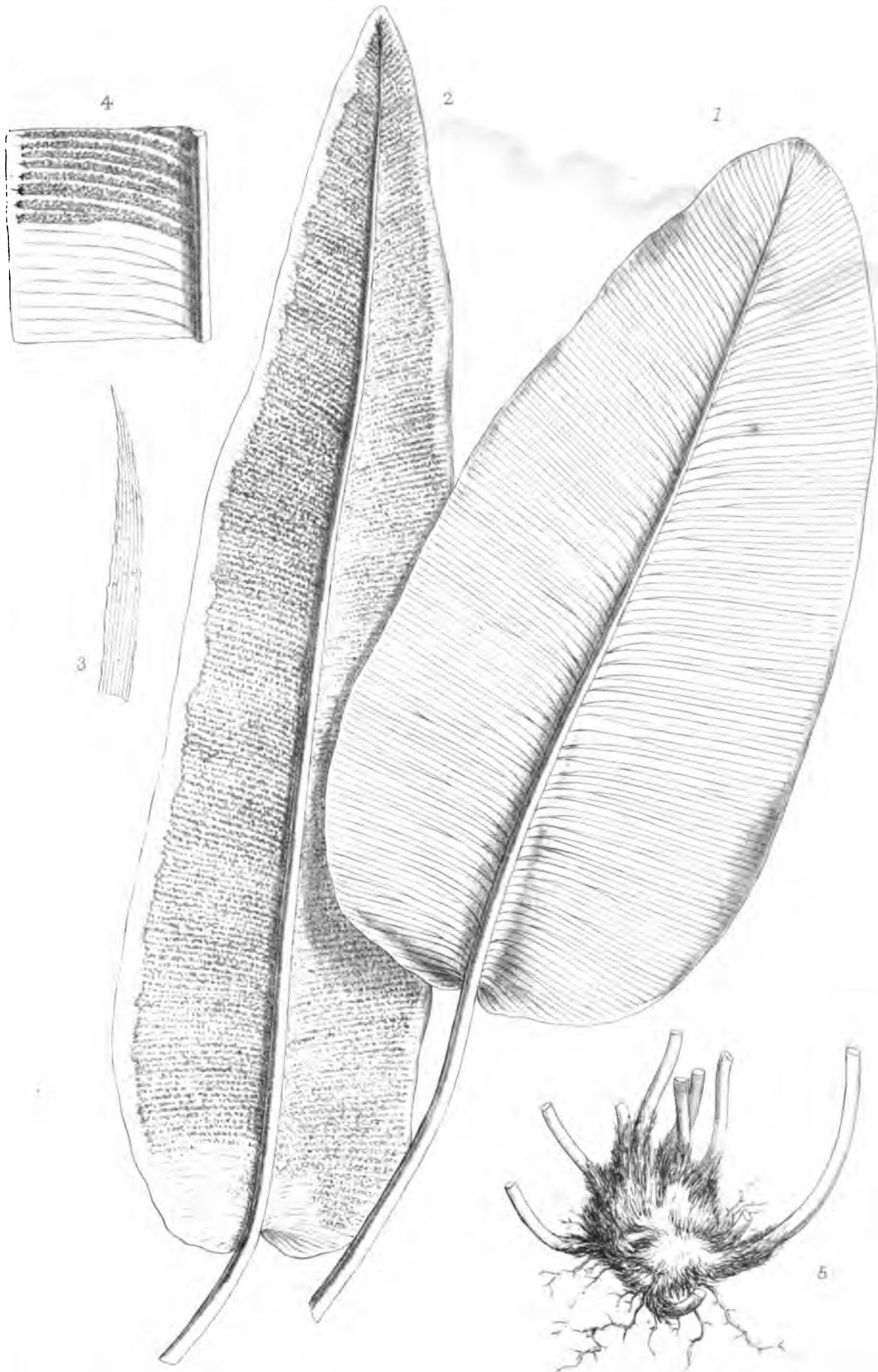
J. N. Fitch imp.



H. Baker del.
J. Allen lith.

GYMNOGRAMME (PTEROZONIUM) CYCLOPHYLLA, *Baker*

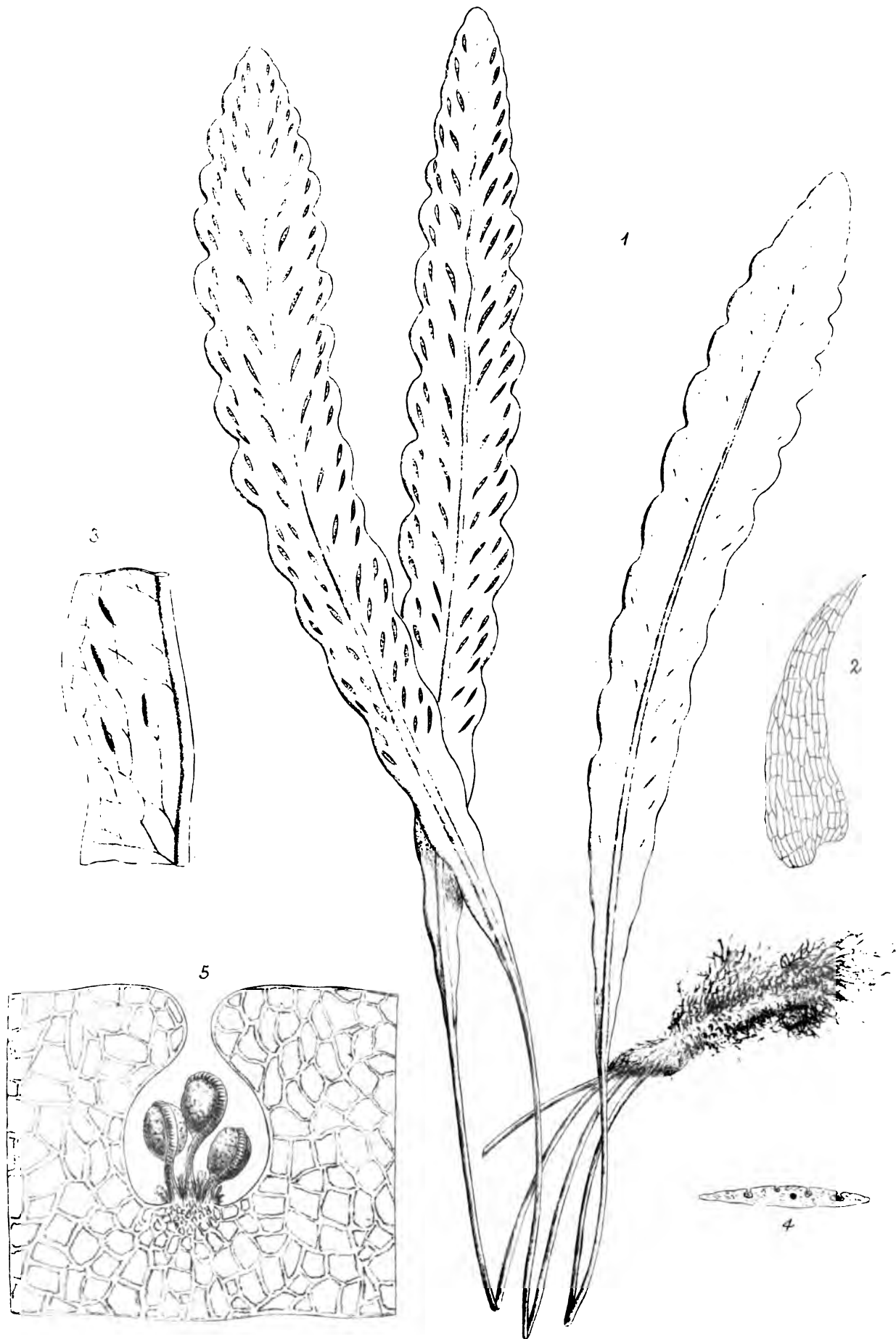
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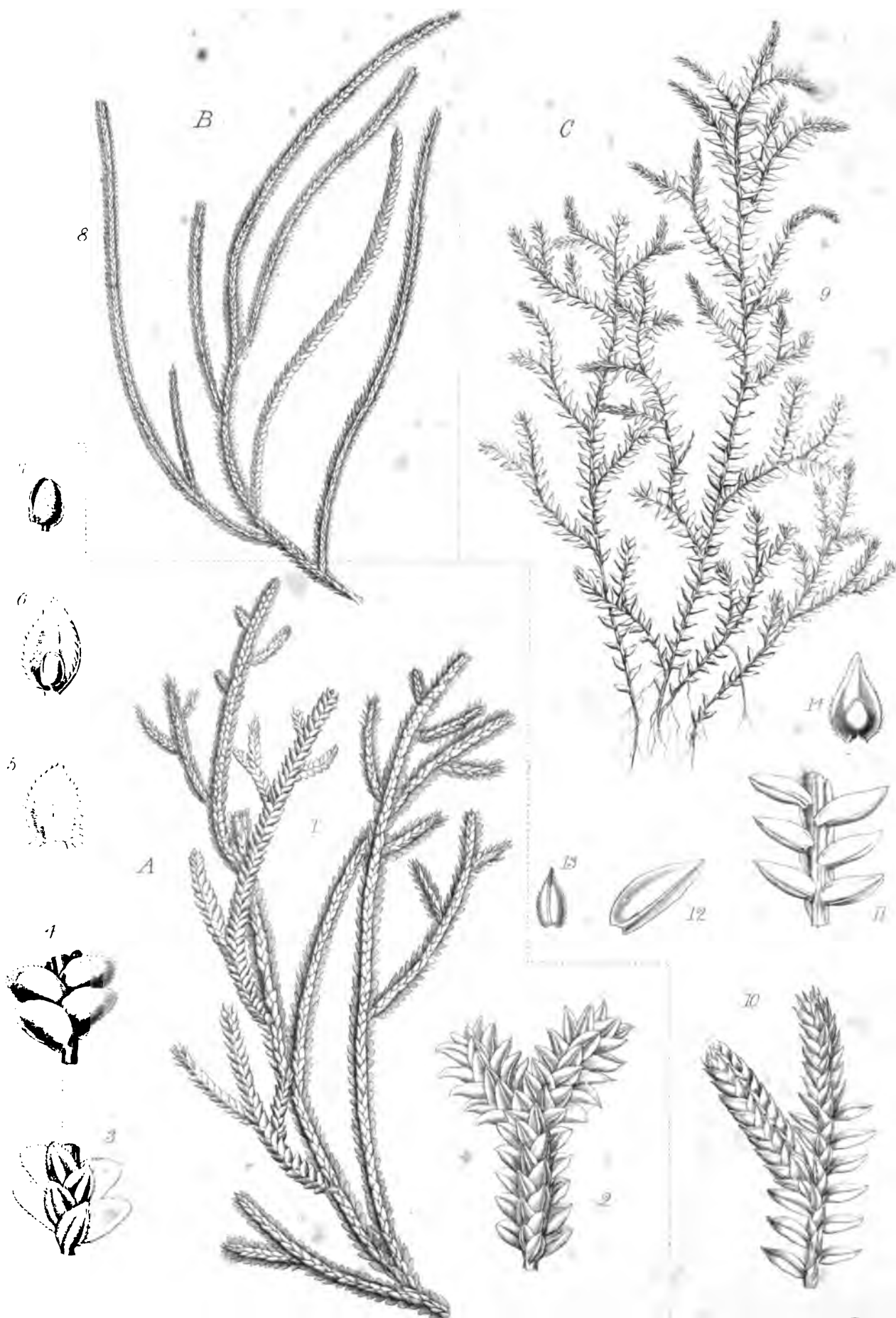


H Baker del.
J Allen lith

GYMNOGRAMME (PTEROZONIUM) ELAPHOGLOSSOIDES, *Baker*

J.N. Fitch imp.
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M. Smith del.
G. Jorman sc.

1-7. SELAGINELLA (STACHYGYNE) RUMIVERNICOSA Baker
8. S. VERNICOSA, var. OLIGOCLADA. 9-14. S. RORAIMENSIS, Baker.

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